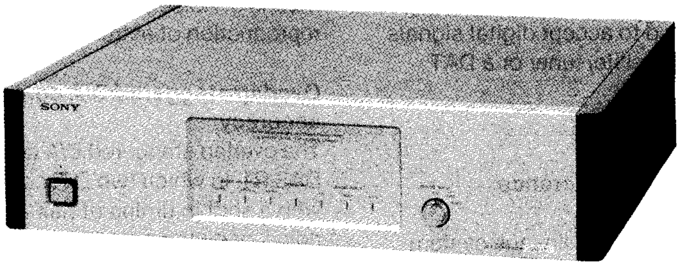
DAS-R1

SERVICE MANUAL

US Model
West Germany Model



SPECIFICATIONS

Digital input jack 1/2	(phono jack) Input level: 0.5 Vp-p ±20% Input impedance: 75 ohms
Twin Link connector	(Twin Link connector) Wavelength: 800 nm Diameter of optical fiber: 0.2 mm (bi-directional)
Number of channels	2 (stereo)
D/A conversion	8 times 18-bit D/A conversion with noise shaping
Output level	2.5 Vrms (digital signal, MAX)
Frequency response	10 Hz – 20,000 Hz $^{+0}_{-0.5}$ dB (when a digital signal having a sampling frequency of 44.1 kHz is input)
Total harmonic distortion	less than 0.0025% (at 1 kHz, Twin Link mode) less than 0.005% (20 – 20,000 Hz, Twin Link mode)
Signal-to-noise ratio	more than 110 dB
Dynamic range	more than 97 dB
Channel separation	more than 100 dB

General

Power requirements	US model: AC 120V, 60Hz WG model: AC 220V, 50Hz
Power consumption	25 watts
Dimensions (w/h/d)	470 × 125 × 410 mm ($18\frac{5}{8} \times 5 \times 16\frac{1}{4}$ inches)
Weight	Approx. 17 kg (37 lb)

Supplied accessories

Audio signal connecting cord (stereo) × 1
Coaxial digital connecting cord × 1

MICROFILM

D/A CONVERTER UNIT

SONY®

FEATURES

The DAS-R1 is a D/A Converter Unit to be used with the CDP-R1 CD Player Unit, and forms a separate-type CD Player System.
The DAS-R1 converts the digital signal picked up from the Compact Disc in the CDP-R1 into an analog (audio) signal. With this separate configuration, since the vibrations and noise generated in the servo and digital circuits required for the CD player can be completely separated from the analog circuits, extremely pure quality is obtained in the resulting sound. Also, the DAS-R1 is designed to accept digital signals from a DBS (Direct Broadcasting Satellite) tuner or a DAT (Digital Audio Tape) deck, etc.

Twin linkage system to reduce phase reference components loss

The Twin Linkage system is a bi-directional linkage system between the CD Player Unit and the D/A Converter Unit. In this system, a linkage to transmit the sync signal from the D/A Converter Unit to the CD Player Unit is added to the conventional data transmission linkage from the CD Player Unit to the D/A Converter Unit. With this system, since the crystal oscillator which is provided in the CD player of conventional systems can be located near the D/A converter section in the D/A converter unit, the fluctuation of the phase components output from the D/A converter unit is eliminated from the audio signal. As a result, stable and enriched reproduction sound is obtained.

Noise shaping for higher fidelity musical information

In the Compact Disc format, 16-bit data is picked up from the Compact Disc 44,100 times per second. The digital filter provided with the DAS-R1 incorporates an 8 times oversampling system which improves the resolution by 8 times over normal resolution. The operation results are processed to 18-bit accuracy and then converted to 16-bit data, with no loss of high-resolution musical information, by means of noise shaping circuitry. This results in the reproduction of extremely high resolution sound.

Overlap staggered D/A conversion with extreme accuracy

The overlap staggered D/A converter is the heart of the DAS-R1, in which two D/A converters per channel operate with a shift in timing of half a period. With this system, the noise, or distortion, components generated from both D/A converters are averaged and reduced, so that a harshless, warm tone is obtained.

Standard coaxial digital inputs

Two coaxial digital inputs (AUX1/AUX2), which conform to the Digital Audio Interface Format, are provided, so that the digital output signal transmitted from a DAT (Digital Audio Tape) deck or a CD player can be accepted. The DAS-R1 accommodates three types of sampling frequencies (32 kHz, 44.1 kHz and 48 kHz), and the corresponding one is automatically selected according to the input digital signals.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

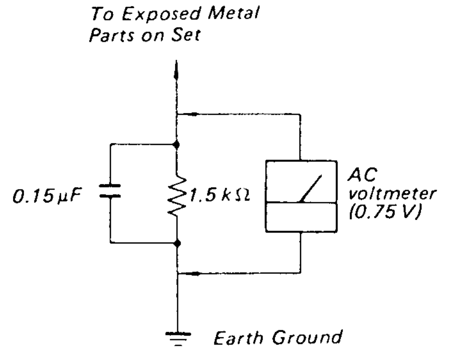
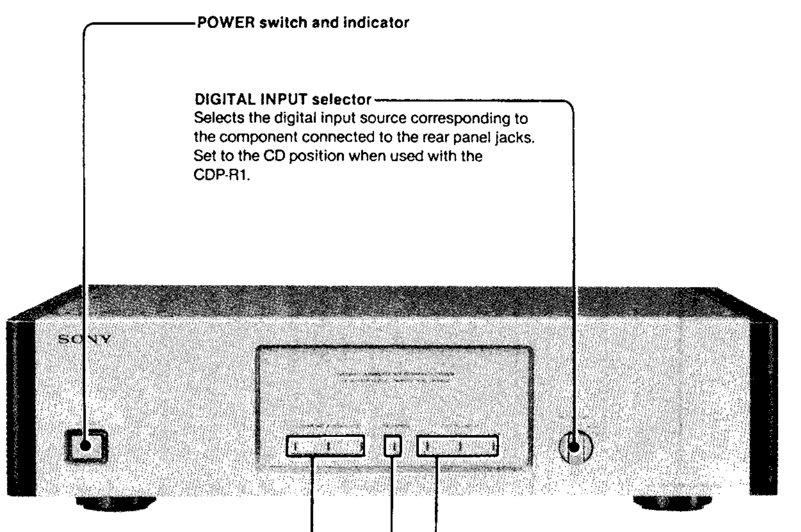


Fig. A. Using an AC voltmeter to check AC leakage.

SECTION 1
GENERAL

1-1. LOCATION AND FUNCTION OF THE CONTROLS



POWER switch and indicator

DIGITAL INPUT selector
Selects the digital input source corresponding to the component connected to the rear panel jacks. Set to the CD position when used with the CDP-R1.

DIGITAL INPUT indicators
One of these indicators, corresponding to the source selected by the DIGITAL INPUT selector, will light.

OPERATING indicator
This indicator lights in orange when the input digital interface is locked and the operations are performed correctly.

SAMPLING FREQUENCY indicators
One of these indicators, corresponding to the program source selected, will light.
32 kHz: For DAT 32 kHz mode, etc.
44 kHz*: For CD, etc.
48 kHz: For DAT standard mode, etc.

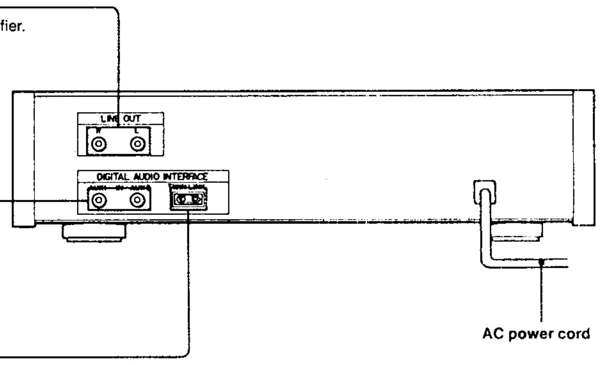
Note
The DAS-R1 is designed to accept the digital signals from a DBS (Direct Broadcasting Satellite) tuner which uses with PCM (digital) signals. (Only for DBS tuners providing a digital output jack which conforms to the EIAJ-format.)

---

* The "44 kHz" indicator lights when the sampling frequency of the input digital signal is 44.1 kHz or 44.056 kHz.

1-2. CONNECTIONS

Rear Panel Connectors


LINE OUT
DIGITAL AUDIO INTERFACE

LINE OUT jacks (RCA type)
Connect to the CD input jacks of an amplifier.

AUX1/AUX2 input jacks
Connect to the coaxial digital output jacks (conforming to the Digital Audio Interface Format, EIAJ) of a DAT deck or CD player.

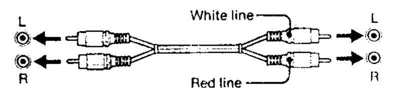
TWIN LINK connector
With the Twin Link optical cable (supplied with the CDP-R1), connect to the TWIN LINK connector of the CDP-R1.

AC power cord

Before Making Any Connections

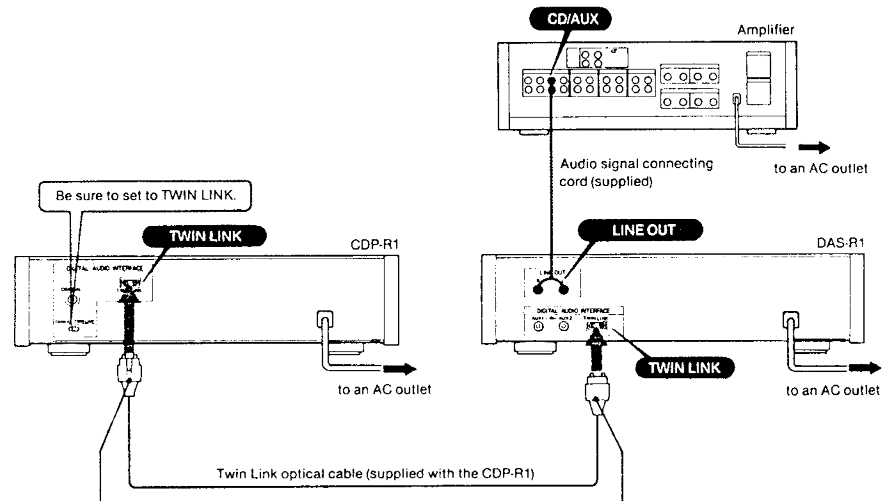
Precautions
- Do not place heavy material on the connection cords. Do not pull the cords forcibly.
- Select the installation place and mount this unit before making any connections. Before transporting the unit, be sure to disconnect all of the connecting cords.

Audio signal connecting cord
Connect the plug with the red line to the R (right) channel jack, and the plug with the white line to the L (left) channel jack.


L
R
White line
Red line
L
R

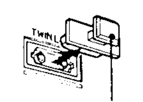
Connection to the CDP-R1

Use the Twin Link optical cable (supplied with the CDP-R1) to connect the CDP-R1 to the DAS-R1.
Before making this connection, be sure to turn the power to all components OFF.


CD/AUX
Amplifier
Audio signal connecting cord (supplied)
to an AC outlet
Be sure to set to TWIN LINK.
TWIN LINK
CDP-R1
LINE OUT
DAS-R1
TWIN LINK
to an AC outlet
to an AC outlet
Twin Link optical cable (supplied with the CDP-R1)

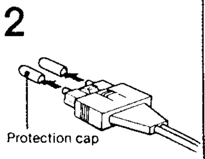
Connection procedure

1



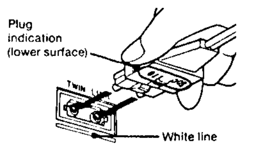
Protection connector cover

2



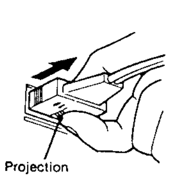
Protection cap

3 Connect the cable connector to the TWIN LINK connector of the DAS-R1 with the plug indication (white colored) matched to the white line marked on the DAS-R1, and push it in until a click sound is heard.


Plug indication (lower surface)
White line

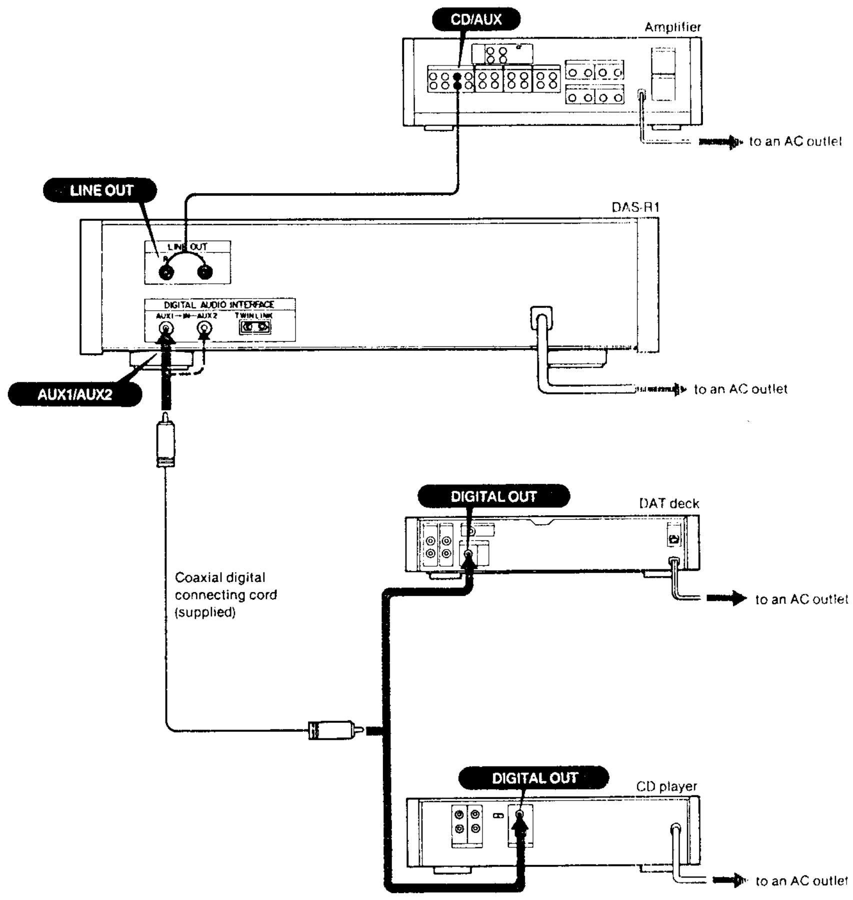
Connect the cable to the CDP-R1 with the plug indication facing upward, and then insert it in the same way as above.

When disconnecting the cable:
Pull on the cable connector while pressing the projection.


Projection

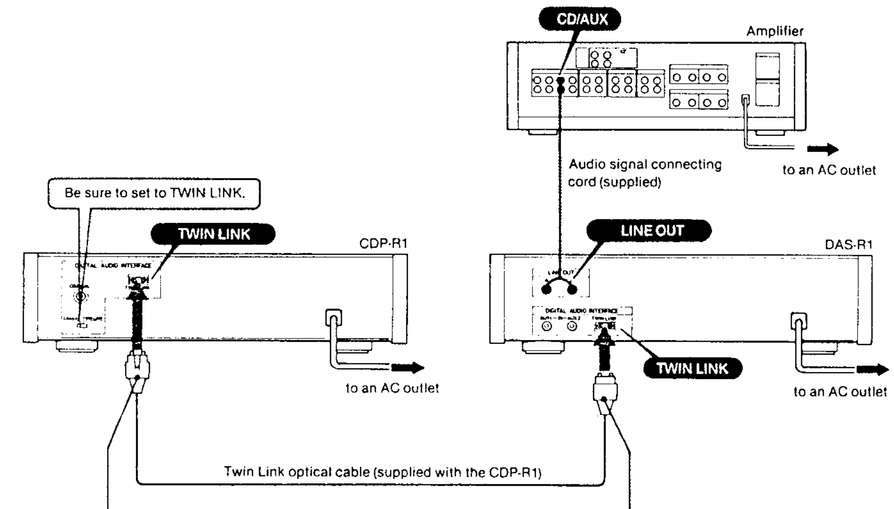
Connection to Digital Components other than the CDP-R1

The DAS-R1 can also be used as an outboard D/A converter unit together with other digital components (such as an optional DAT deck or CD player).


CD/AUX
Amplifier
to an AC outlet
LINE OUT
DAS-R1
AUX1/AUX2
to an AC outlet
Coaxial digital connecting cord (supplied)
DIGITAL OUT
DAT deck
to an AC outlet
DIGITAL OUT
CD player
to an AC outlet

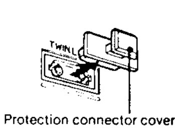
1-3. TECHNICAL DESCRIPTION

connect the CDP-R1 to the DAS-R1.
Before making this connection, be sure to turn the power to all components OFF.


Be sure to set to TWIN LINK.
TWIN LINK
CDP-R1
to an AC outlet
CD/AUX
Amplifier
Audio signal connecting cord (supplied)
to an AC outlet
LINE OUT
DAS-R1
TWIN LINK
to an AC outlet
Twin Link optical cable (supplied with the CDP-R1)

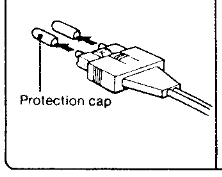
Connection procedure

1



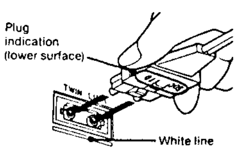
Protection connector cover

2



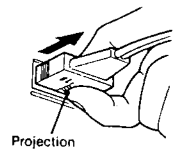
Protection cap

3 Connect the cable connector to the TWIN LINK connector of the DAS-R1 with the plug indication (white colored) matched to the white line marked on the DAS-R1, and push it in until a click sound is heard.

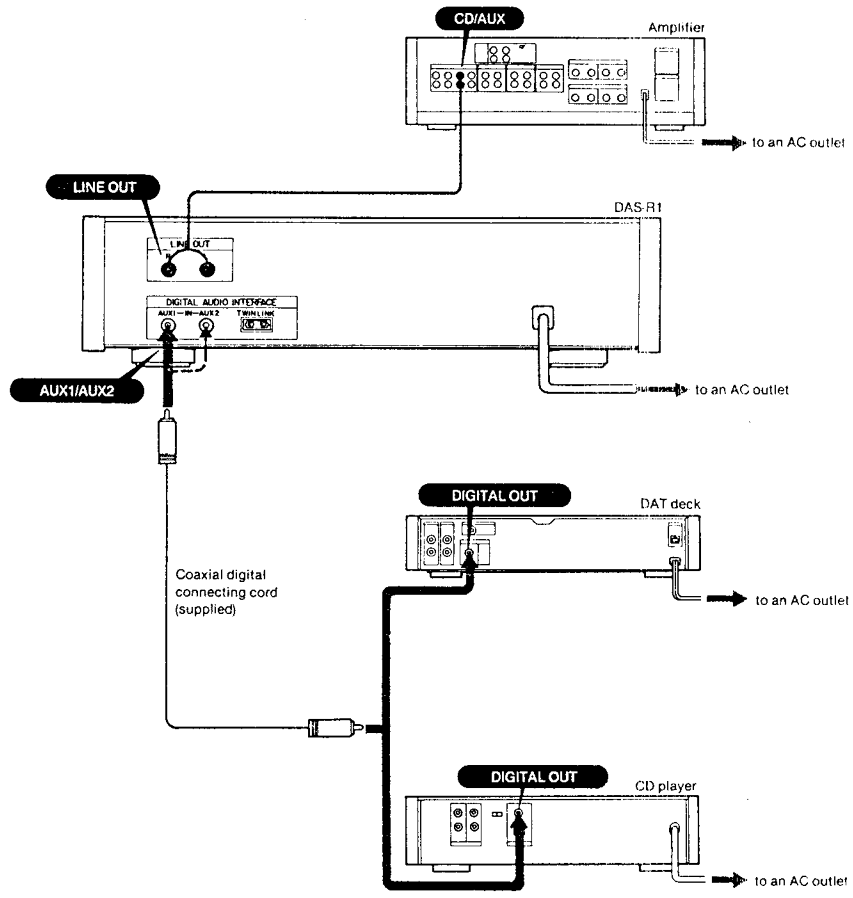

Plug indication (lower surface)
White line

Connect the cable to the CDP-R1 with the plug indication facing upward, and then insert it in the same way as above.

When disconnecting the cable:
Pull on the cable connector while pressing the projection.


Projection

unit together with other digital components (such as an optional DAT deck or CD player).


CD/AUX
Amplifier
to an AC outlet
LINE OUT
DAS-R1
AUX1/AUX2
to an AC outlet
DIGITAL OUT
DAT deck
Coaxial digital connecting cord (supplied)
to an AC outlet
DIGITAL OUT
CD player
to an AC outlet

1-3. TECHNICAL DESCRIPTION

D/A Master Clock — Twin Optical Linkage

The D/A conversion process plays a major role in determining the sound quality of a CD player. In a separate CD player system, isolating this D/A conversion process from servo and digital signal processing noise is very beneficial in terms of sound quality.
The CDP-R1 and DAS-R1 are prime examples of perfect separation. In addition to the data transmission interface from the player to the converter, a clock interface from the converter to the player is provided. These two interfaces are interconnected with two separate fiber optic data transmission cables, a "twin optical linkage" configuration.

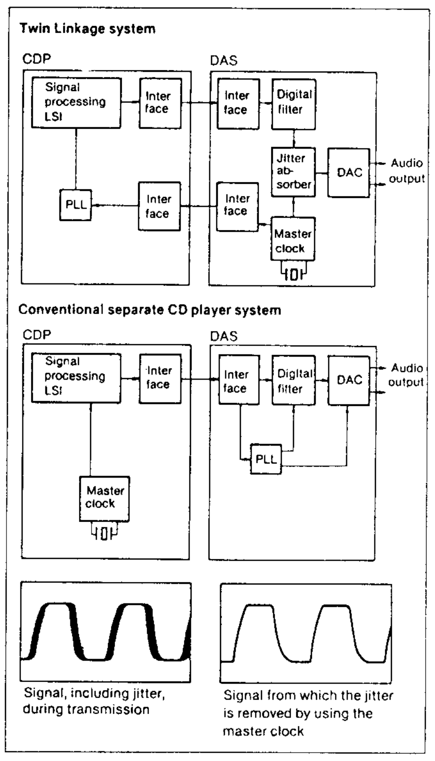
In conventional separate systems, the master clock is in the CD player. Both the data and clock signal are sent to the D/A converter, where the analog waveform is constructed on the time axis based on the clock signal. (Refer to right figure.)

Since the data is digital information, there is no problem with waveform deformation or loss during transmission. However, a form of "jitter" can be generated from the clock signal, degrading sound purity.
Jitter is defined as a "flickering" on the time axis, and has some affect on waveform rise and recovery timing, manifesting in a sort of "back and forth" sound realization. If this occurs, the output waveform "jitters" back and forth, resulting in one form of phase distortion. In this connection, a single wavelength at the CD maximum frequency of 20,000 Hz is 50 μ sec. If this is analyzed at the same 16-bit quantization, it equals: 1/216(= 65,536) × 50 μ sec. = 0.75 nsec.
Thus, if jitter on this level occurs, it will affect sound quality.
Generally speaking, digital data transfer by optical fiber has the advantage of electrical noise transmission being cut out.
However, jitter on the order of a few nanoseconds is generated, and this value cannot be overlooked from the viewpoint of sound quality.
Making use of a quartz crystal oscillator, the master clock operates at extremely high precision, with jitter at the measurable limit of 0.1 nanoseconds, or 1/10,000,000,000th of a second.
Keeping this precision in the signal sent to the D/A converter is a major factor in sound quality. Therefore, it is best to have the quartz crystal oscillation of the master clock in the D/A converter unit, sent directly to the D/A converter circuit.

This clock is also necessary in the CD player, so a special clock transmission circuit has been constructed, enabling the clock signal to be sent to the CD player from the D/A converter.
Synchronizing the D/A operation with data pickup off the disc along the data line is called Twin Optical Linkage. This system prevents jitter from being mixed in with the audio output, dramatically reducing phase component flickering in the audio output signal for astonishingly realistic sound playback.

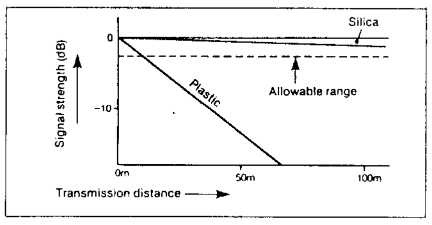
Silica Glass Optical Fiber

In the Twin optical Linkage configuration, the effects of jitter generation in the cable are markedly reduced, enabling the use of better devices with a higher standard of performance for better quality sound reproduction. The optical fiber used in the linkage is highly reliable plastic clad silica glass core optical fiber, with superb light transmission characteristics. The CDP-R1 is supplied with a 1 meter length of SOC-10 twin-link cable, which has a transmission capability of over 100 meters.


Twin Linkage system
CDP
DAS
Signal processing LSI
Inter face
Inter face
Digital filter
Jitter ab-sorber
DAC
Audio output
PLL
Inter face
Inter face
Master clock
Conventional separate CD player system
CDP
DAS
Signal processing LSI
Inter face
Inter face
Digital filter
DAC
Audio output
PLL
Master clock

Signal, including jitter, during transmission

Signal from which the jitter is removed by using the master clock



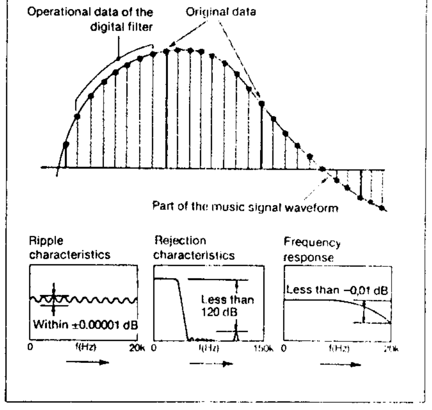
8 times oversampling errorless digital filter with 18-bit resolution

The digital data read by the CDP-R1 is transmitted through the data side of the twin optical linkage to the DAS-R1 at a data rate, as read from the CD, of 44,100 data per second. In the DAS-R1, this audio data is first sent to the CXD-1144 digital filter which has a data rate 8 times higher at 352,800 per second, thus performing 8 times oversampling, as right figure shows.
As a result, the quantity of data is increased, raising the information density of the analog output while reducing the load on the analog filter for an improvement in sound quality.
The quality and accuracy of a digital filter can be judged on the basis of three characteristics which are a by-product of its operation. They are ripple, echo, and rejection, and all three have a great bearing on the resulting sound quality.
In simple terms, each is a form of operational error. Therefore, the CXD-1144 digital filter has been designed for remarkably large scale operation capability, with some 293 stages in total, to greatly reduce the rate of error. The resulting ripple, echo, and rejection characteristics are impressive:

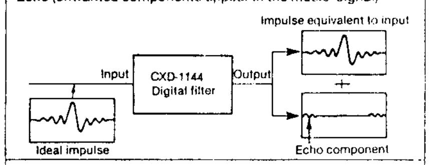
bandwidth ripple: within ±0.00001 dB
echo level: −124 dB or less
rejection: greater than 120 dB up to 150 kHz

These group characteristics, when compared to the resolution of the 18-bit operation output values, are indeed sufficiently low enough for the digital filter to be considered virtually errorless in actual use.

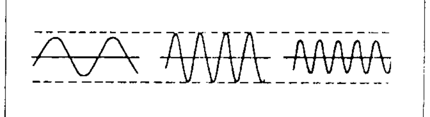
Errorless data generation with the 8-times oversampling digital filter



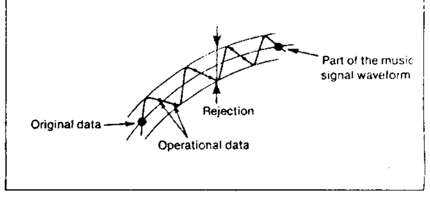
Echo (unwanted components appear in the music signal)


Impulse equivalent to input
Input
CXD-1144 Digital filter
Output
Ideal impulse
Echo component

Ripple (level fluctuates for different frequencies)

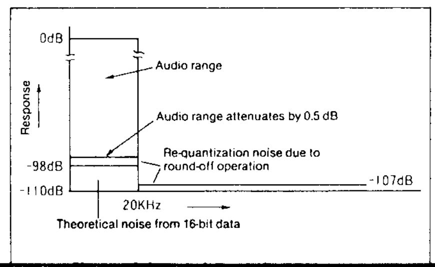


Rejection


Part of the music signal waveform
Rejection
Original data
Operational data

18-bit D/A Conversion with Noise Shaping —Noise shaping during 18-bit to 16-bit conversion to obtain 18-bit resolution—

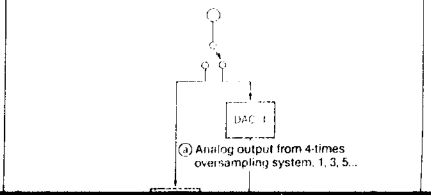
The CXD-1144 is an 18-bit output digital filter, which has a conversion result somewhat greater resolution than the 16-bit data recorded on a CD. That is, 16-bit output runs in the order of [0] [1] [2] [3]..., while 18-bit output runs like [0] [0.25] [0.5] [0.75] [1] [1.25]... and so on. The D/A converter of the DAS-R1 is a 16-bit input type, so 18-bit data must be converted into 16-bit with no loss of musical information. For this reason, the CXD-1329 noise shaper was developed.
In converting ordinary 18-bit to 16-bit, re-assigning [0.25] to [0], and [0.5] and [0.75] to [1] is simply rounding to the nearest place (counting 0.5 and over as "1" and discarding 0.4 or less), and it is



Overlap Staggered 8 Times D/A Conversion for distortion-free, low-noise signal reproduction

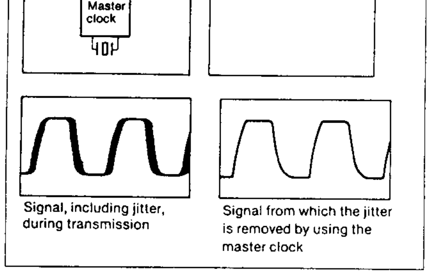
This system performs D/A conversion at four times normal speed, with two converters for per channel, each operates parallelly with a half cycle delayed timing. The 8 times oversampling data output from the digital filter is alternated between them to achieve a smooth, continuous output.
Namely, odd-numbered data is converted by DAC-1 and even-numbered data is converted by DAC-2. Each DAC operates at four times speed, and the sum of both output makes 8 times audio signal.
When the D/A converter on one side begins operation, the D/A converter on the other side has just finished first half of working time, so that both operate in an overlapping fashion, as right

Overlap staggered D/A conversion system


8-times oversampling digital data, 1, 2, 3, 4, 5...
DAC-1
ⓐ Analog output from 4-times oversampling system, 1, 3, 5...

the same 16-bit quantization, it equals: 1/216(= 65,536) × 50 μ sec. = 0.75 nsec.
Thus, if jitter on this level occurs, it will affect sound quality.
Generally speaking, digital data transfer by optical fiber has the advantage of electrical noise transmission being cut out.
However, jitter on the order of a few nanoseconds is generated, and this value cannot be overlooked from the viewpoint of sound quality.
Making use of a quartz crystal oscillator, the master clock operates at extremely high precision, with jitter at the measurable limit of 0.1 nanoseconds, or 1/10,000,000,000th of a second.
Keeping this precision in the signal sent to the D/A converter is a major factor in sound quality. Therefore, it is best to have the quartz crystal oscillation of the master clock in the D/A converter unit, sent directly to the D/A converter circuit.

This clock is also necessary in the CD player, so a special clock transmission circuit has been constructed, enabling the clock signal to be sent to the CD player from the D/A converter.
Synchronizing the D/A operation with data pickup off the disc along the data line is called Twin Optical Linkage. This system prevents jitter from being mixed in with the audio output, dramatically reducing phase component flickering in the audio output signal for astonishingly realistic sound playback.

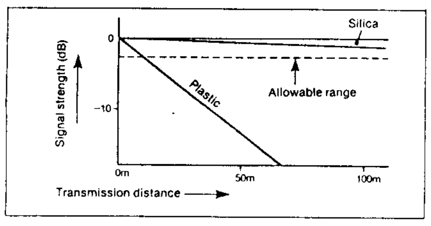

Master clock

Signal, including jitter, during transmission

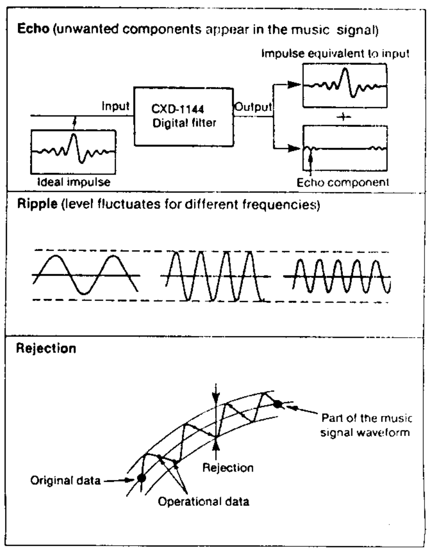
Signal from which the jitter is removed by using the master clock

Silica Glass Optical Fiber

In the Twin optical Linkage configuration, the effects of jitter generation in the cable are markedly reduced, enabling the use of better devices with a higher standard of performance for better quality sound reproduction. The optical fiber used in the linkage is highly reliable plastic clad silica glass core optical fiber, with superb light transmission characteristics. The CDP-R1 is supplied with a 1 meter length of SOC-10 twin-link cable, which has a transmission capability of over 100 meters.

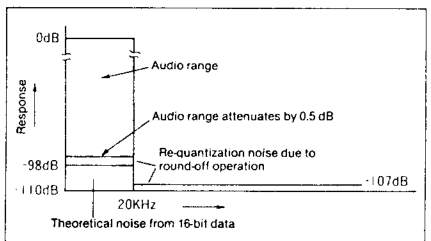


enough for the digital filter to be considered virtually errorless in actual use.

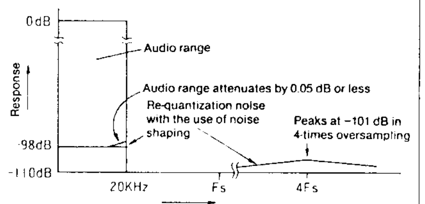

Echo (unwanted components appear in the music signal)
Impulse equivalent to input
Input
CXD-1144
Digital filter
Output
+
Ideal impulse
Echo component
Ripple (level fluctuates for different frequencies)
Rejection
Part of the music signal waveform
Original data
Rejection
Operational data

18-bit D/A Conversion with Noise Shaping —Noise shaping during 18-bit to 16-bit conversion to obtain 18-bit resolution—

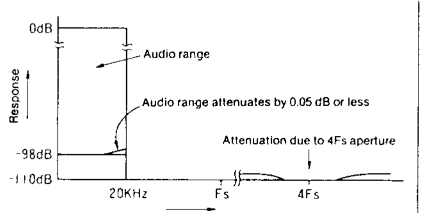
The CXD-1144 is an 18-bit output digital filter, which has a conversion result somewhat greater resolution than the 16-bit data recorded on a CD. That is, 16-bit output runs in the order of [0] [1] [2] [3]..., while 18-bit output runs like [0] [0.25] [0.5] [0.75] [1] [1.25]... and so on. The D/A converter of the DAS-R1 is a 16-bit input type, so 18-bit data must be converted into 16-bit with no loss of musical information. For this reason, the CXD-1329 noise shaper was developed.
In converting ordinary 18-bit to 16-bit, re-assigning [0.25] to [0], and [0.5] and [0.75] to [1] is simply rounding to the nearest place (counting 0.5 and over as "1" and discarding 0.4 or less), and it is only the difference in value which represents information that is completely lost. This effect manifests itself in what is called "re-quantization noise" (error).
During noise shaping, the CXD-1329 operates in a way to reduce this effect. For example, if [0.25] data repeats four times, the CXD-1329 outputs [0] [0] [0] [1] to the D/A converter. This operation better preserves musical information by maintaining proper values for playback sound with a higher information density.



Change of characteristics during 18-bit to 16-bit conversion with the round-off method



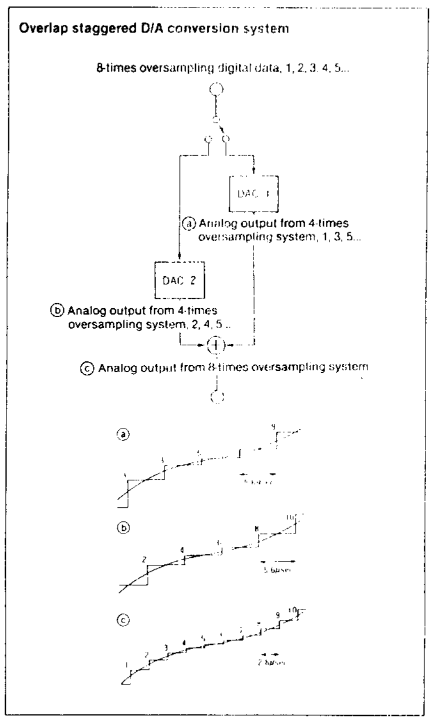
Change of characteristics during 18-bit to 16-bit conversion with noise shaping

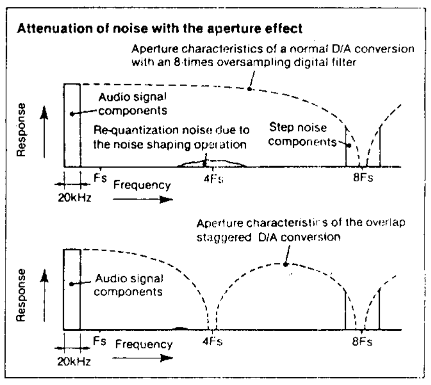


Characteristics for a combination of noise shaping and overlap staggered D/A converter

Overlap Staggered 8 Times D/A Conversion for distortion-free, low-noise signal reproduction

This system performs D/A conversion at four times normal speed, with two converters for per channel, each operates parallelly with a half cycle delayed timing. The 8 times oversampling data output from the digital filter is alternated between them to achieve a smooth, continuous output.
Namely, odd-numbered data is converted by DAC-1 and even-numbered data is converted by DAC-2. Each DAC operates at four times speed, and the sum of both output makes 8 times audio signal.
When the D/A converter on one side begins operation, the D/A converter on the other side has just finished first half of working time, so that both operate in an overlapping fashion, as right figure shows. The output obtained is the average value of the two D/A converters. This means that noise and distortion are also averaged, enabling a maximum 3 dB improvement. At the same time, output current is doubled, achieving a 6 dB improvement in the S/N ratio in the final analog stage.
There is another merit in the combined effects of both Noise Shaping and Overlap Staggered D/A conversion. Noise Shaping converts from 18 bits down to 16 bits, and though it reduces quantization noise through an ingenious reassignment of values as explained previously, it is also a technique that shifts re-quantization noise, which normally peaks at the high end of the audio spectrum, up to around 4 fs. Although this markedly reduces quantization noise in the audio spectrum, it does not actually eliminate the noise itself.
Right figure shows how it takes shape in the high frequency region centering around 4 fs, and it can be said that this is one of the weak points of Noise Shaping.
However, the output characteristics of Overlap Staggered D/A conversion, as shown in right figure, indicate a "blank" interval around 4 fs with no output. This corresponds with the Noise Shaping quantization peak, resulting in much of the noise being eliminated from the output.
Since Overlap Staggered D/A conversion requires a total of four D/A converters for both the left and right channels, group characteristics are superior, lending a soft, warm character to the music.


Overlap staggered D/A conversion system
8-times oversampling digital data, 1, 2, 3, 4, 5...
DAC 1
ⓐ Analog output from 4-times oversampling system, 1, 3, 5...
DAC 2
ⓑ Analog output from 4-times oversampling system, 2, 4, 5...
ⓒ Analog output from 8-times oversampling system
ⓐ
ⓑ
ⓒ



SECTION 2
ELECTRICAL ADJUSTMENT

Master Clock OSC Adjustment (ANALOG BOARD)

Mode	CD (DIGITAL INPUT Switch)
Signal	No signal
Measurement point	TP (fig. 1)
Measurement equipment	Frequency counter
Adjustment elements	C203, 204, 205
Specified value	11.2896MHz±100Hz

Connect or disconnect C203, C204 and C205, so that the frequency becomes 11.2896MHz±100Hz.

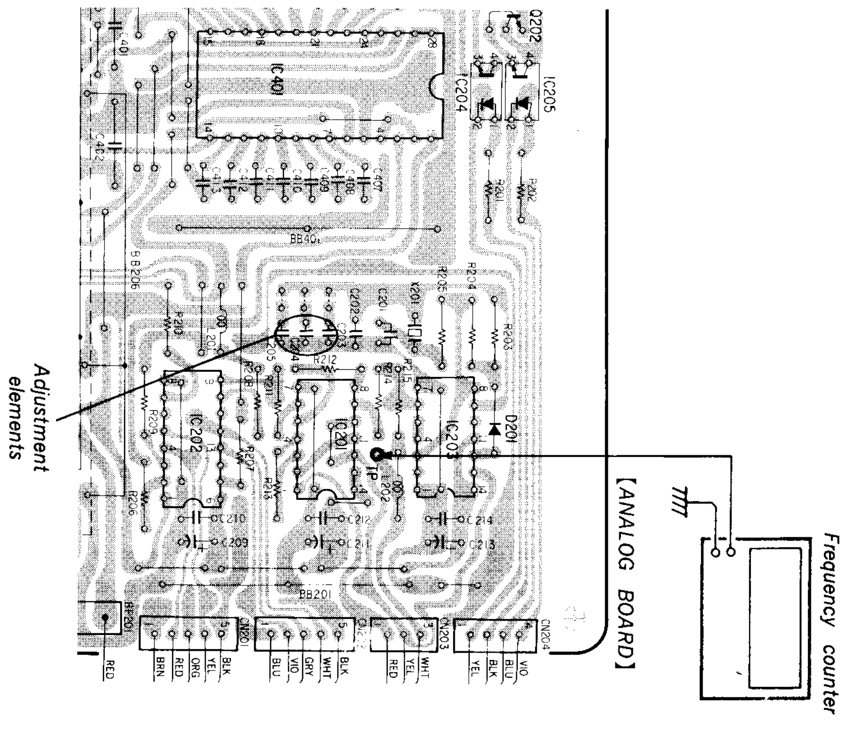

Frequency counter
[ANALOG BOARD]
IC205
Q202
C204
IC401
D201
IC203
IC201
IC202
TP
CN204
CN203
CN201
BP201
VIO
BLU
BLK
YEL
WHT
RED
GRY
ORG
BRN
Adjustment elements

fig. 1

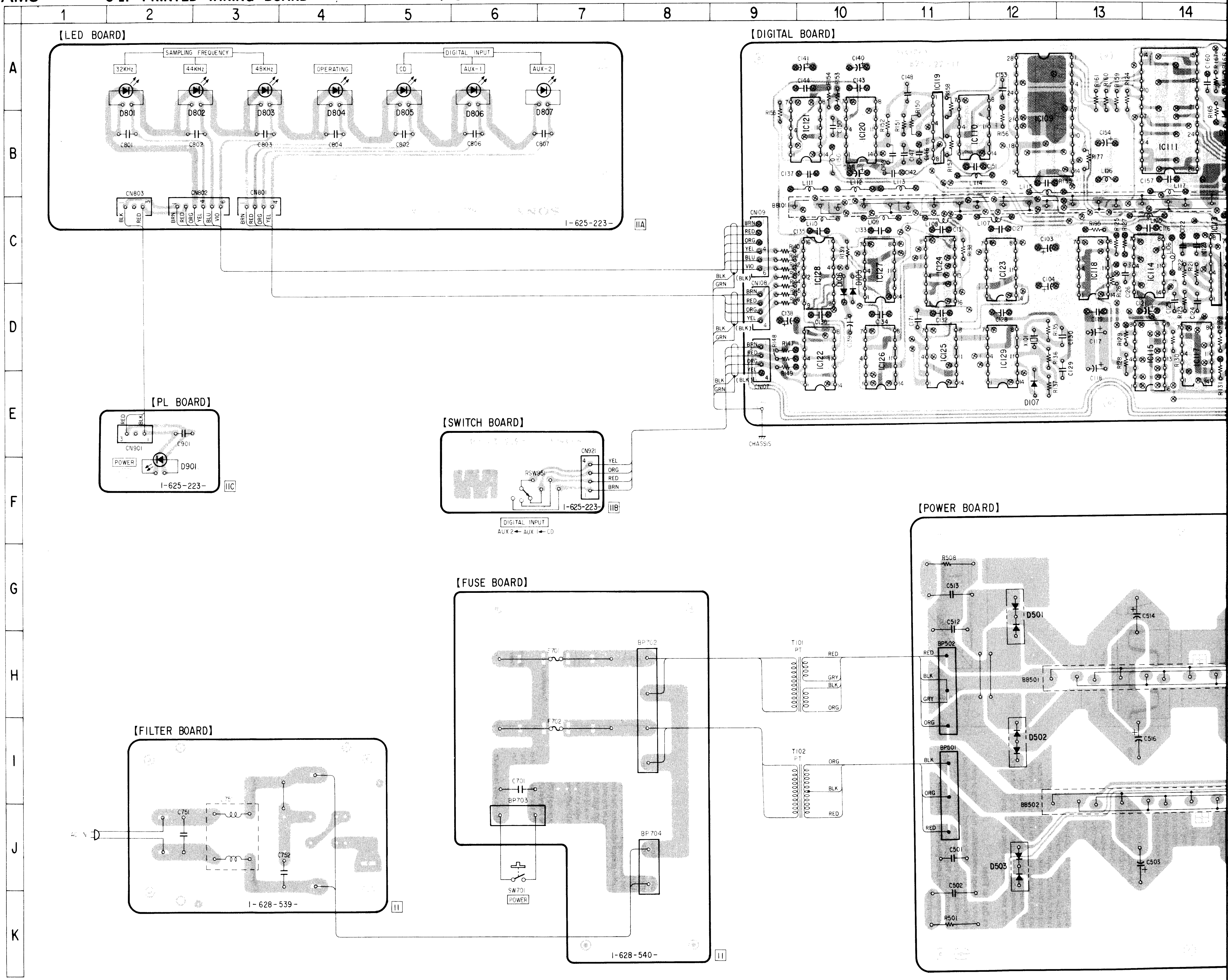
SECTION 3
DIAGRAMS

- **Semiconductor Location**

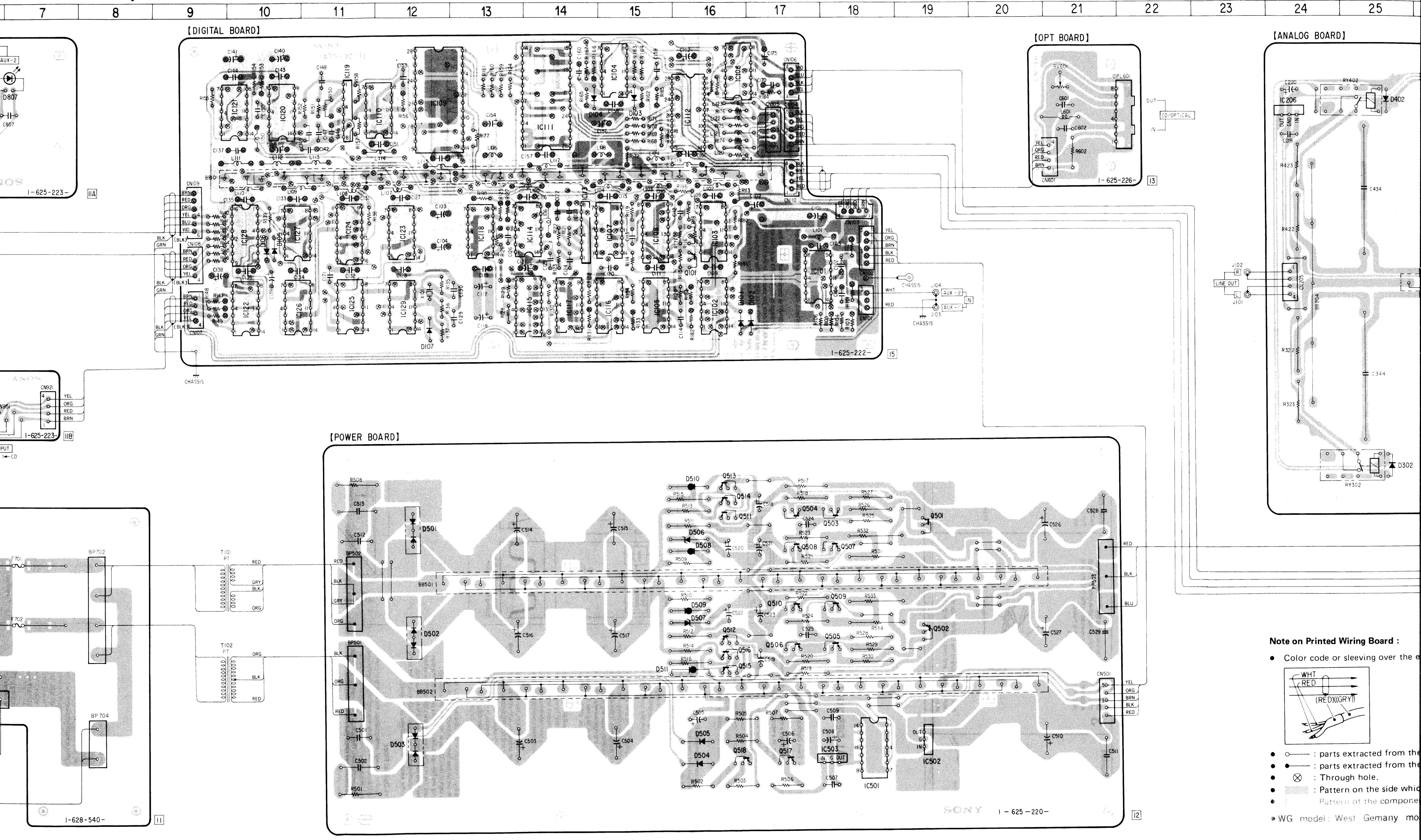
Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
D101	E-16	IC120	B-10	Q505	I-18
D102	E-17	IC121	B-10	Q506	I-17
D103	B-15	IC122	D-10	Q507	H-18
D104	B-14	IC123	C-12	Q508	H-17
D105	D-10	IC124	C-11	Q509	I-18
D106	D-10	IC125	D-11	Q510	I-17
D107	E-12	IC126	D-10	Q511	G-16
D201	B-33	IC127	C-10	Q512	I-16
D301	G-28	IC128	C-10	Q513	G-16
D302	G-25	IC129	D-12	Q514	G-16
D401	B-29	IC201	C-33	Q515	I-16
D402	B-25	IC202	D-33	Q516	I-16
D501	G-12	IC203	B-33	Q517	K-17
D502	I-12	IC204	B-31	Q518	K-16
D503	J-12	IC205	B-31		
D504	K-16	IC206	B-24		
D505	J-16	IC208	F-34		
D506	H-16	IC209	F-33		
D507	I-16	IC301	F-31		
D508	H-16	IC302	E-29		
D509	I-16	IC303	E-29		
D510	G-16	IC304	E-28		
D511	I-16	IC401	C-31		
D801	A-2	IC402	D-29		
D802	A-3	IC403	D-29		
D803	A-3	IC404	C-28		
D804	A-4	IC501	K-18		
D805	A-5	IC502	J-19		
D806	A-6	IC503	K-18		
D807	A-7				
D901	F-2	Q101	D-16		
		Q201	B-30		
IC101	D-17	Q202	B-31		
IC102	D-16	Q301	E-27		
IC103	C-16	Q302	G-28		
IC104	A-15	Q303	G-27		
IC105	D-15	Q304	G-27		
IC106	A-16	Q305	E-26		
IC107	C-15	Q306	F-26		
IC108	C-15	Q307	F-27		
IC109	B-12	Q401	C-27		
IC110	B-12	Q402	B-28		
IC111	B-14	Q403	B-27		
IC112	B-16	Q404	B-27		
IC113	C-14	Q405	C-26		
IC114	C-14	Q406	B-26		
IC115	D-14	Q407	C-27		
IC116	D-15	Q501	G-19		
IC117	D-14	Q502	I-19		
IC118	C-18	Q503	G-18		
IC119	B-11	Q504	G-17		

3-1. PRINTED WIRING BOARD

- Refer to page 18 for Semiconductor Lead Layouts.

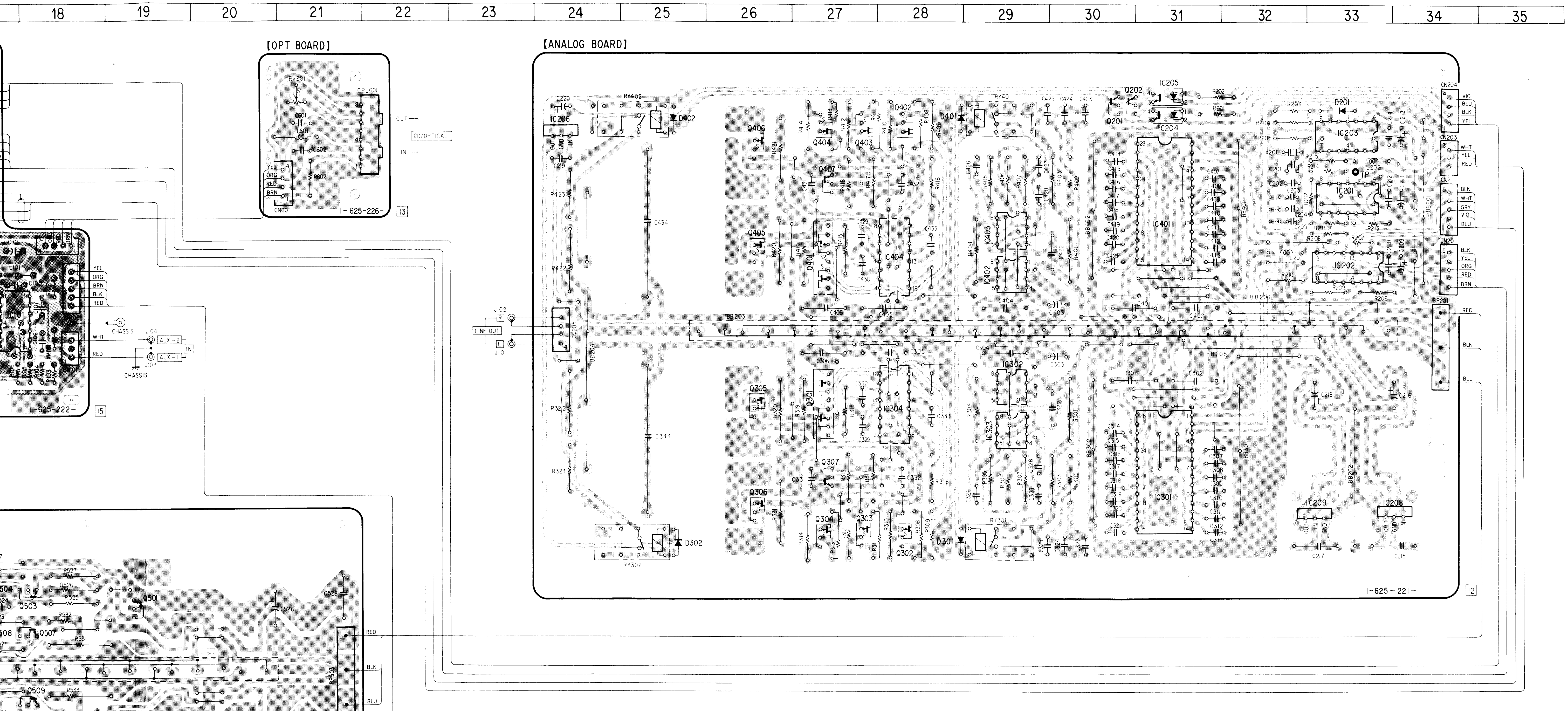
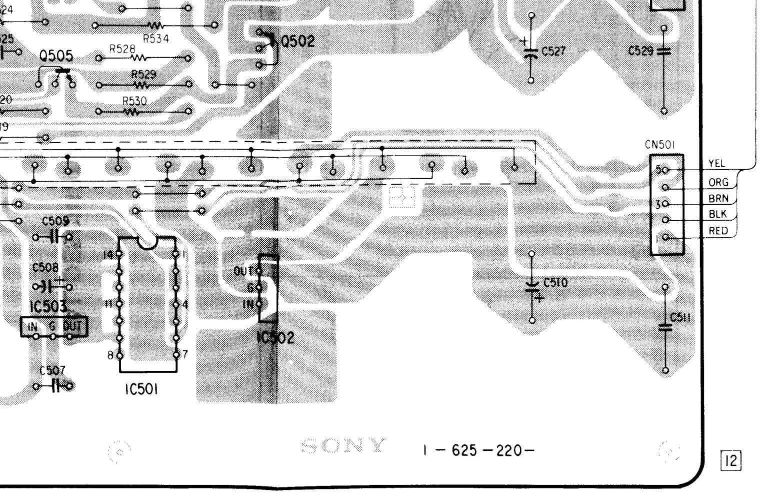

1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
J
K
[LED BOARD]
SAMPLING FREQUENCY
32KHz
44KHz
48KHz
OPERATING
DIGITAL INPUT
CD
AUX-1
AUX-2
D801
D802
D803
D804
D805
D806
D807
CN803
CN802
CN801
1-625-223-
IIA
[DIGITAL BOARD]
IC121
IC120
IC119
IC110
IC109
IC111
IC128
IC127
IC124
IC123
IC118
IC114
IC122
IC126
IC125
IC129
IC115
D106
D105
D107
CN109
CN108
CN107
CHASSIS
[PL BOARD]
CN901
C901
POWER
D901
1-625-223-
IIC
[SWITCH BOARD]
CN921
RSW951
YEL
ORG
RED
BRN
1-625-223-
IIB
DIGITAL INPUT
AUX 2 ← AUX 1 → CD
[FUSE BOARD]
F701
F702
BP702
C701
BP703
BP704
SW701
POWER
1-628-540-
II
[FILTER BOARD]
C751
C752
1-628-539-
II
T101
PT
T102
PT
[POWER BOARD]
R508
C513
C512
BP502
D501
C514
BB501
D502
C516
BP501
BB502
C501
D503
C503
C502
R501

Semiconductor Lead Layouts.


7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
[DIGITAL BOARD]
1-625-222-
15
[OPT BOARD]
1-625-226-
13
CD/OPTICAL
LINE OUT
AUX-2
AUX-1
CHASSIS
[ANALOG BOARD]
1-625-223-
11A
11B
[POWER BOARD]
1-625-220-
12
1-628-540-
11
T101 PT
T102 PT
RED
BLK
GRY
ORG
YEL
BRN
BLU
WHT

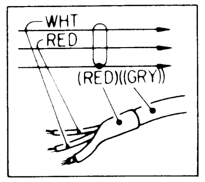
Note on Printed Wiring Board :

- Color code or sleeving over the e
- ○—— : parts extracted from the
- ●—— : parts extracted from the
- ⊗ : Through hole.
- ▨ : Pattern on the side whic
- ▨ : Pattern of the compone
- * WG model : West Gemany mo



18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
[OPT BOARD]
[ANALOG BOARD]
OUT
CD/OPTICAL
IN
CN601
1-625-226-
13
LINE OUT
J102
J101
R
L
IC206
IC205
IC204
IC203
IC201
IC202
IC401
IC404
IC402
IC403
IC301
IC302
IC303
IC304
IC208
IC209
RY401
RY402
RY301
RY302
D401
D402
D301
D302
D201
Q201
Q202
BB203
BB205
BB206
BP201
CN201
CN203
CN204
RED
BLK
BLU
YEL
ORG
BRN
WHT
VIO
GRY
1-625-221-
12
CHASSIS
AUX-2
AUX-1
IN
J103
J104
IC101
1-625-222-
15
Q501
Q502
Q503
Q505
Q507
Q509
IC501
IC502
IC503
PP503
CN501
SONY
1-625-220-
12

Note on Printed Wiring Board :

- Color code or sleeving over the end of the jacket.


WHT
RED
(RED)((GRY))

- ○—— : parts extracted from the component side.
- ●—— : parts extracted from the conductor side.
- ⊗ : Through hole.
- ▨ : Pattern on the side which is seen.
- ☐ : Pattern of the component side

- WG model: West Gemany model

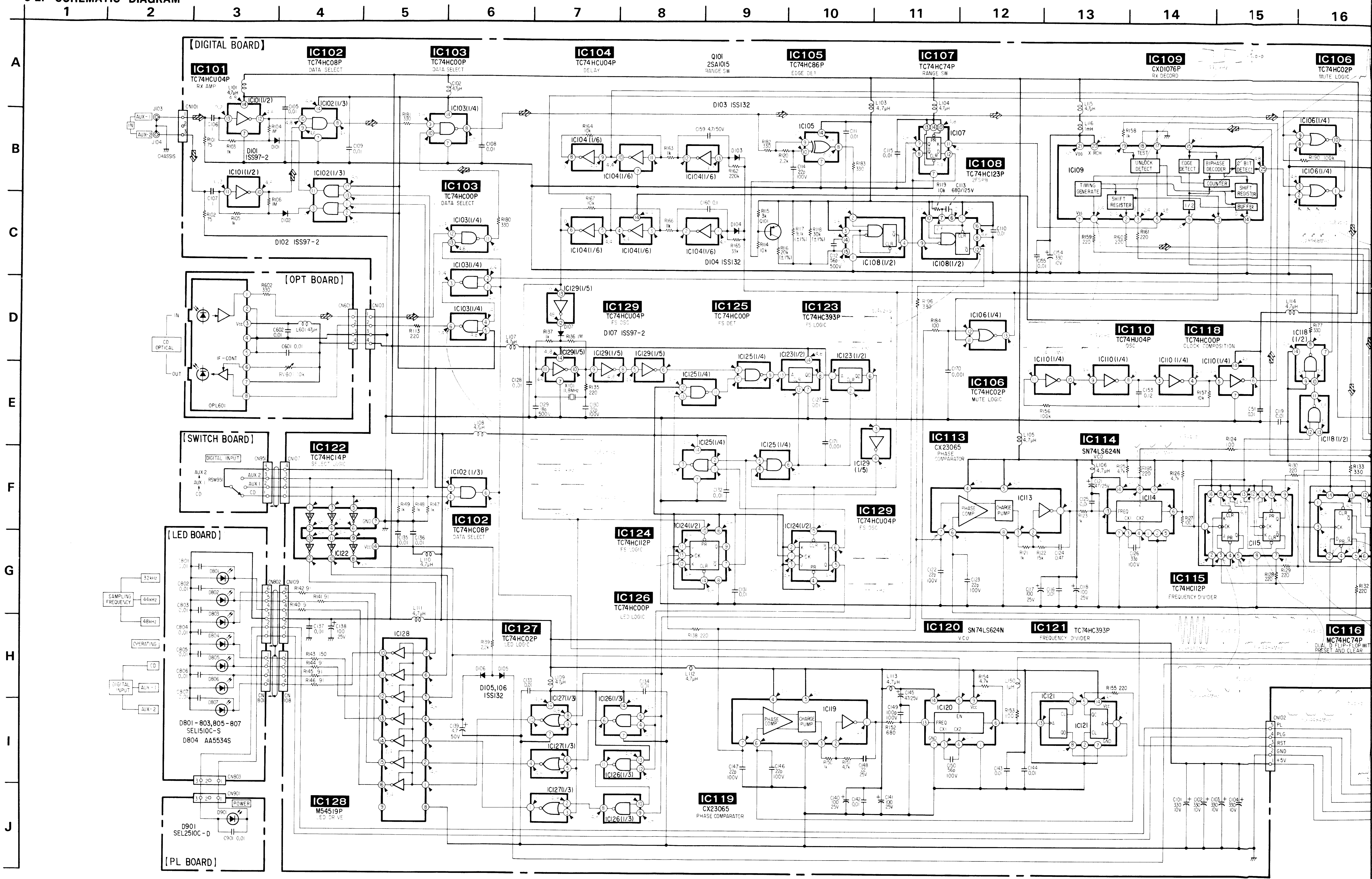
Note on Schematic Diagram :

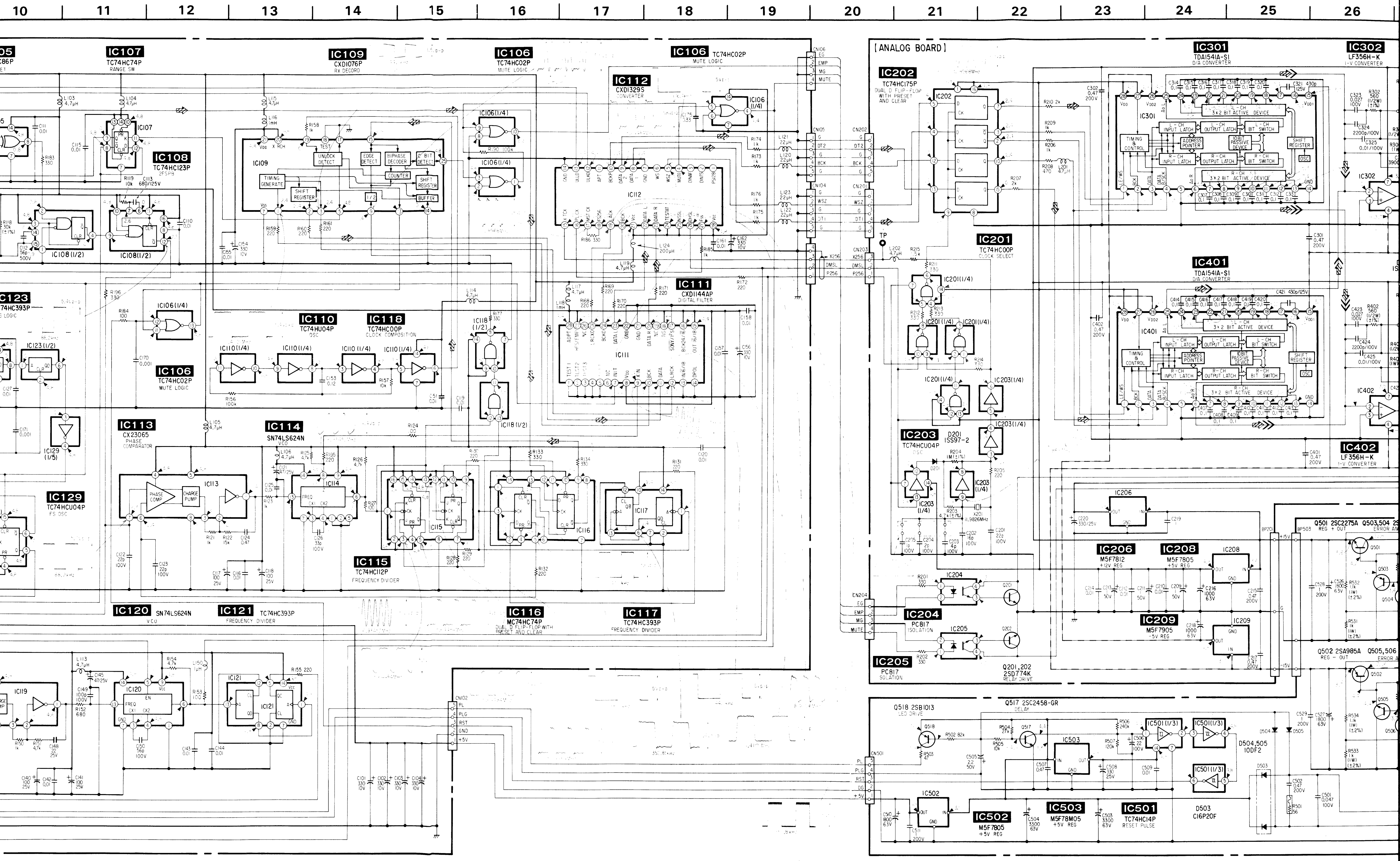
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- Switch

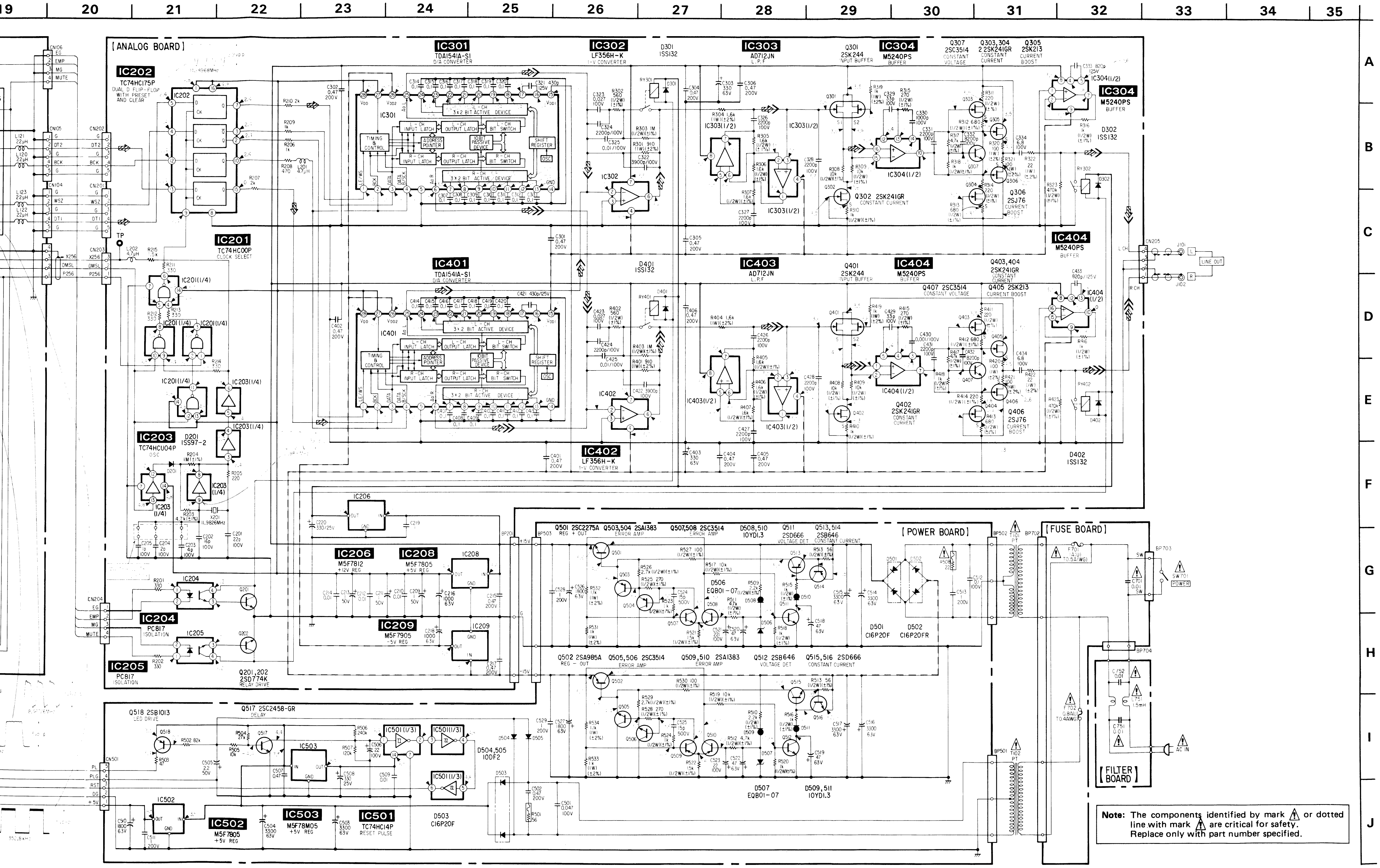
Ref. No.	Switch	Position
SW701	POWER	ON
RSW951	DIGITAL INPUT	CD

- ▬▬ : B+ bus.
- ▬ ▬ ▬ : B– bus.
- ☐ : adjustment for repair.
  CD player (CDP-R1,etc) with digital output is required for measurement of this set.
- Play back any compact disc, receive the digital signal.
- Voltages are taken with a VOM (50 kΩ/V).
- Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken to ground in playback mode by using oscilloscope.
- ⇨ : CD signal pass
- ⇨> : L-CH signal pass
- ⇨>> : R-CH signal pass
- WG model: West Gemany model

3-2. SCHEMATIC DIAGRAM


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
[DIGITAL BOARD]
IC101
TC74HCU04P
RX AMP
IC102
TC74HC08P
DATA SELECT
IC103
TC74HC00P
DATA SELECT
IC104
TC74HCU04P
DELAY
Q101
2SA1015
RANGE SW
IC105
TC74HC86P
EDGE DET
IC107
TC74HC74P
RANGE SW
IC109
CXD1076P
RX DECORD
IC106
TC74HC02P
MUTE LOGIC
IC108
TC74HC123P
D103 ISS132
D104 ISS132
D101 ISS97-2
D102 ISS97-2
J103
J104
AUX-1
AUX-2
IN
CHASSIS
CN101
TIMING GENERATE
SHIFT REGISTER
UNLOCK DETECT
EDGE DETECT
BIPHASE DECODER
COUNTER
BUFFER
[OPT BOARD]
CD OPTICAL
IN
OUT
IF-CONT
OPL601
L601 47μH
RV601 10k
CN601
CN103
IC129
TC74HCU04P
FS OSC
D107 ISS97-2
X101 11.8MHz
IC125
TC74HC00P
FS DET
IC123
TC74HC393P
FS LOGIC
IC110
TC74HU04P
OSC
IC118
TC74HC00P
CLOCK COMPOSITION
IC106
TC74HC02P
MUTE LOGIC
[SWITCH BOARD]
DIGITAL INPUT
AUX 2
AUX 1
CD
RSW951
CN951
CN107
IC122
TC74HC14P
SELECT LOGIC
IC102
TC74HC08P
DATA SELECT
IC124
TC74HC112P
FS LOGIC
IC126
TC74HC00P
LED LOGIC
IC113
CX23065
PHASE COMPARATOR
PHASE COMP
CHARGE PUMP
IC114
SN74LS624N
VCO
FREQ
IC115
TC74HC112P
FREQUENCY DIVIDER
[LED BOARD]
SAMPLING FREQUENCY
32kHz
44kHz
48kHz
OPERATING
DIGITAL INPUT
CD
AUX-1
AUX-2
D801-803,805-807
SEL1510C-S
D804 AA5534S
CN802
CN109
CN801
CN108
CN803
CN901
IC120 SN74LS624N
VCO
IC121 TC74HC393P
FREQUENCY DIVIDER
IC116
MC74HC74P
DUAL D FLIP-FLOP WITH PRESET AND CLEAR
IC127
TC74HC02P
LED LOGIC
D105,106
ISS132
IC128
M54519P
LED DRIVE
IC119
CX23065
PHASE COMPARATOR
CN102
PL
PLG
RST
GND
+5V
D901
SEL2510C-D
POWER
[PL BOARD]


10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
IC107 TC74HC74P RANGE SW
IC109 CXD1076P RX DECORD
IC106 TC74HC02P MUTE LOGIC
IC106 TC74HC02P MUTE LOGIC
IC112 CXD1329S CONVERTER
IC108 TC74HC123P 2FS PB
IC123 TC74HC393P
IC110 TC74HU04P OSC
IC118 TC74HC00P CLOCK COMPOSITION
IC106 TC74HC02P MUTE LOGIC
IC111 CXD1144AP DIGITAL FILTER
IC113 CX23065 PHASE COMPARATOR
IC114 SN74LS624N VCO
IC129 TC74HCU04P FS OSC
IC115 TC74HC112P FREQUENCY DIVIDER
IC120 SN74LS624N VCO
IC121 TC74HC393P FREQUENCY DIVIDER
IC116 MC74HC74P DUAL D FLIP-FLOP WITH PRESET AND CLEAR
IC117 TC74HC393P FREQUENCY DIVIDER
[ANALOG BOARD]
IC202 TC74HC175P DUAL D FLIP-FLOP WITH PRESET AND CLEAR
IC301 TDA1541A-S1 D/A CONVERTER
IC302 LF356H-K I-V CONVERTER
IC201 TC74HC00P CLOCK SELECT
IC401 TDA1541A-S1 D/A CONVERTER
IC203 TC74HCU04P OSC
D201 1SS97-2
IC402 LF356H-K I-V CONVERTER
IC206 M5F7812 +12V REG
IC208 M5F7805 +5V REG
IC204 PC817 ISOLATION
IC209 M5F7905 -5V REG
IC205 PC817 ISOLATION
Q201,202 2SD774K RELAY DRIVE
Q501 2SC2275A Q503,504 REG + OUT ERROR AMP
Q502 2SA985A Q505,506 REG - OUT ERROR AMP
Q518 2SB1013 LED DRIVE
Q517 2SC2458-GR DELAY
D504,505 10DF2
D503 C16P20F
IC502 M5F7805 +5V REG
IC503 M5F78M05 +5V REG
IC501 TC74HC14P RESET PULSE
CN106 EG EMP MG MUTE
CN105 G DT2 G BCK G
CN104 G WSZ G DT1 G
CN202 DT2 BCK
CN201 WSZ DT1
CN203 X256 DMSL P256
CN204 EG EMP MG MUTE
CN102 PL PLG RST GND +5V
CN501 PL PLG RST GG +5V
BP503 +15V G -15V
BP201
TP


19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
A
B
C
D
E
F
G
H
I
J
[ANALOG BOARD]
IC202
TC74HC175P
DUAL D FLIP-FLOP WITH PRESET AND CLEAR
IC301
TDA1541A-S1
D/A CONVERTER
IC302
LF356H-K
I-V CONVERTER
D301
1SS132
IC303
AD712JN
L.P.F
Q301
2SK244
INPUT BUFFER
IC304
M5240PS
BUFFER
Q307
2SC3514
CONSTANT VOLTAGE
Q303,304
2SK241GR
CONSTANT CURRENT
Q305
2SK213
CURRENT BOOST
IC304(1/2)
Q302 2SK241GR
CONSTANT CURRENT
Q306
2SJ76
CURRENT BOOST
D302
1SS132
IC201
TC74HC00P
CLOCK SELECT
IC401
TDA1541A-S1
D/A CONVERTER
D401
1SS132
IC403
AD712JN
L.P.F
Q401
2SK244
INPUT BUFFER
IC404
M5240PS
BUFFER
Q403,404
2SK241GR
CONSTANT CURRENT
Q407 2SC3514
CONSTANT VOLTAGE
Q405 2SK213
CURRENT BOOST
IC402
LF356H-K
I-V CONVERTER
Q402
2SK241GR
CONSTANT CURRENT
Q406
2SJ76
CURRENT BOOST
D402
1SS132
IC203
TC74HCU04P
OSC
D201
1SS97-2
X201
11.9826MHz
3 x 2 BIT ACTIVE DEVICE
L-CH INPUT LATCH
L-CH OUTPUT LATCH
L-CH BIT SWITCH
R-CH INPUT LATCH
R-CH OUTPUT LATCH
R-CH BIT SWITCH
TIMING & CONTROL
ADDRESS POINTER
10BIT PASSIVE DEVICE
SHIFT REGISTER
OSC
CN106
EG
EMP
MG
MUTE
CN105
CN202
DT2
BCK
CN104
CN201
WSZ
DT1
CN203
X256
DMSL
P256
TP
CN205
L CH
R CH
J101
J102
LINE OUT
IC206
IC206
M5F7812
+12V REG
IC208
M5F7805
+5V REG
IC209
M5F7905
-5V REG
CN204
IC204
PC817
ISOLATION
IC205
PC817
ISOLATION
Q201,202
2SD774K
RELAY DRIVE
BP201
BP503
Q501 2SC2275A
REG + OUT
Q503,504 2SA1383
ERROR AMP
Q507,508 2SC3514
ERROR AMP
D508,510
10YD1.3
Q511
2SD666
VOLTAGE DET
Q513,514
2SB646
CONSTANT CURRENT
D506
EQB01-07
[POWER BOARD]
D501
C16P20F
D502
C16P20FR
BP502
T101
PT
BP702
[FUSE BOARD]
F701
T0.5A(WG)
BP703
SW701
POWER
BP704
Q502 2SA985A
REG - OUT
Q505,506 2SC3514
ERROR AMP
Q509,510 2SA1383
ERROR AMP
Q512 2SB646
VOLTAGE DET
Q515,516 2SD666
CONSTANT CURRENT
Q518 2SB1013
LED DRIVE
Q517 2SC2458-GR
DELAY
IC503
IC501(1/3)
D504,505
10DF2
CN501
PL
PLG
RST
DG
+5V
IC502
IC502
M5F7805
+5V REG
IC503
M5F78M05
+5V REG
IC501
TC74HC14P
RESET PULSE
D503
C16P20F
D507
EQB01-07
D509,511
10YD1.3
BP501
T102
PT
F702
T0.4A(WG)
[FILTER BOARD]
L751
1.5mH
AC IN

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

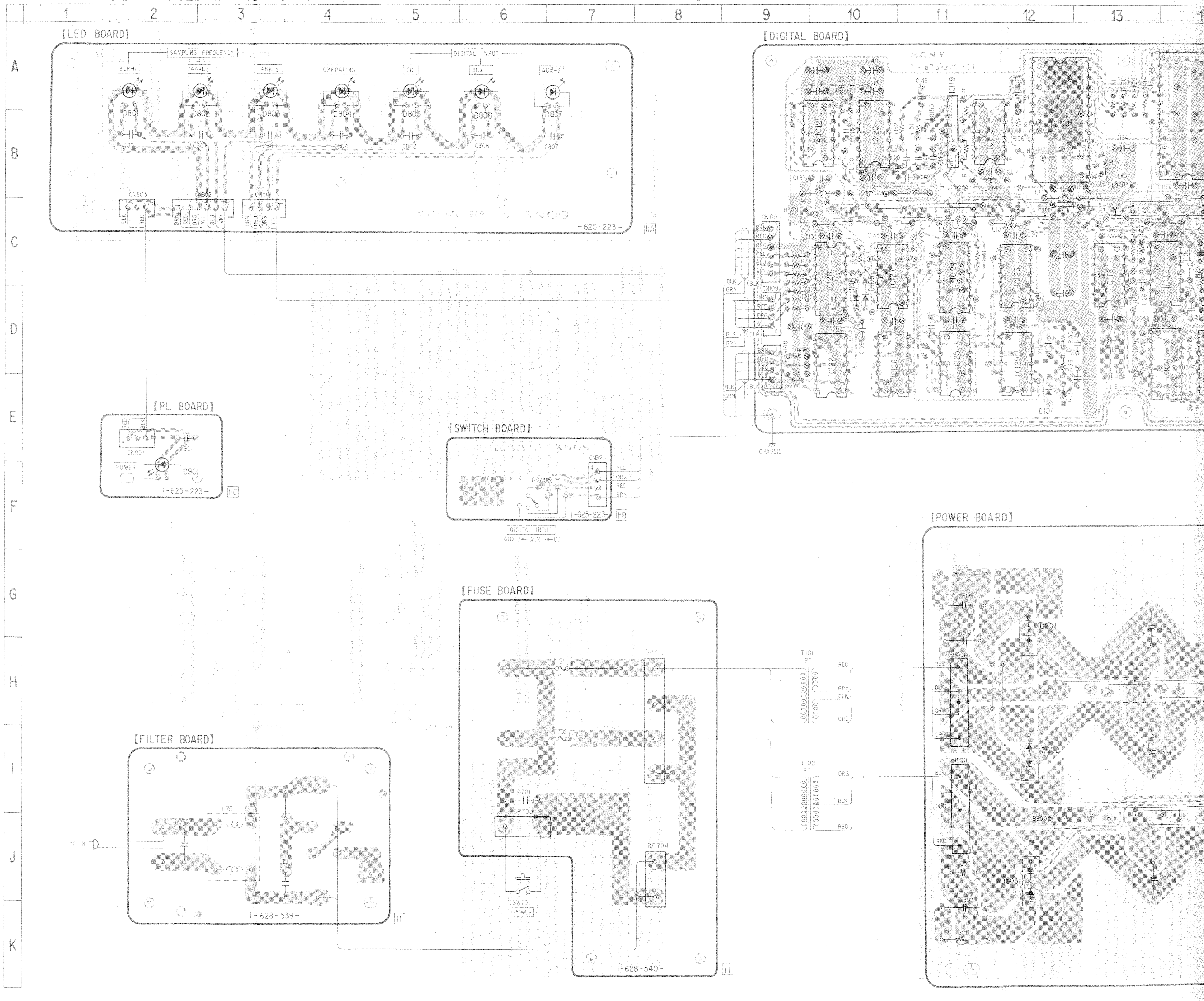
SECTION 3
DIAGRAMS

• Semiconductor Location

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
D101	E-16	IC120	B-10	Q505	I-18
D102	E-17	IC121	B-10	Q506	I-17
D103	B-15	IC122	D-10	Q507	H-18
D104	B-14	IC123	C-12	Q508	H-17
D105	D-10	IC124	C-11	Q509	I-18
D106	D-10	IC125	D-11	Q510	I-17
D107	E-12	IC126	D-10	Q511	G-16
D201	B-33	IC127	C-10	Q512	I-16
D301	G-28	IC128	C-10	Q513	G-16
D302	G-25	IC129	D-12	Q514	G-16
D401	B-29	IC201	C-33	Q515	I-16
D402	B-25	IC202	D-33	Q516	I-16
D501	G-12	IC203	B-33	Q517	K-17
D502	I-12	IC204	B-31	Q518	K-16
D503	J-12	IC205	B-31		
D504	K-16	IC206	B-24		
D505	J-16	IC208	F-34		
D506	H-16	IC209	F-33		
D507	I-16	IC301	F-31		
D508	H-16	IC302	E-29		
D509	I-16	IC303	E-29		
D510	G-16	IC304	E-28		
D511	I-16	IC401	C-31		
D801	A-2	IC402	D-29		
D802	A-3	IC403	D-29		
D803	A-3	IC404	C-28		
D804	A-4	IC501	K-18		
D805	A-5	IC502	J-19		
D806	A-6	IC503	K-18		
D807	A-7				
D901	F-2	Q101	D-16		
		Q201	B-30		
IC101	D-17	Q202	B-31		
IC102	D-16	Q301	E-27		
IC103	C-16	Q302	G-28		
IC104	A-15	Q303	G-27		
IC105	D-15	Q304	G-27		
IC106	A-16	Q305	E-26		
IC107	C-15	Q306	F-26		
IC108	C-15	Q307	F-27		
IC109	B-12	Q401	C-27		
IC110	B-12	Q402	B-28		
IC111	B-14	Q403	B-27		
IC112	B-16	Q404	B-27		
IC113	C-14	Q405	C-26		
IC114	C-14	Q406	B-26		
IC115	D-14	Q407	C-27		
IC116	D-15	Q501	G-19		
IC117	D-14	Q502	I-19		
IC118	C-18	Q503	G-18		
IC119	B-11	Q504	G-17		

3-1. PRINTED WIRING BOARD

• Refer to page 18 for Semiconductor Lead Layouts.


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
J
K
[LED BOARD]
SAMPLING FREQUENCY
32KHz
44KHz
48KHz
OPERATING
DIGITAL INPUT
CD
AUX-1
AUX-2
D801
D802
D803
D804
D805
D806
D807
CN803
CN802
CN801
1-625-223-
SONY
[DIGITAL BOARD]
1-625-222-11
IC109
IC110
IC111
IC118
IC119
IC120
IC121
IC122
IC123
IC124
IC125
IC126
IC127
IC128
IC129
D105
D106
D107
CN109
CN105
CN107
CHASSIS
[PL BOARD]
CN901
C901
POWER
D901
1-625-223-
[SWITCH BOARD]
CN921
RSW951
YEL
ORG
RED
BRN
1-625-223-
DIGITAL INPUT
AUX 2 ← AUX 1 ← CD
[FUSE BOARD]
F701
F702
C701
BP702
BP703
BP704
SW701
POWER
1-628-540-
T101 PT
T102 PT
RED
GRY
BLK
ORG
[FILTER BOARD]
AC IN
C751
L751
C752
1-628-539-
[POWER BOARD]
R508
C513
C512
D501
C514
BP502
BB501
D502
C516
BP501
BB502
C501
C502
D503
C503
R501

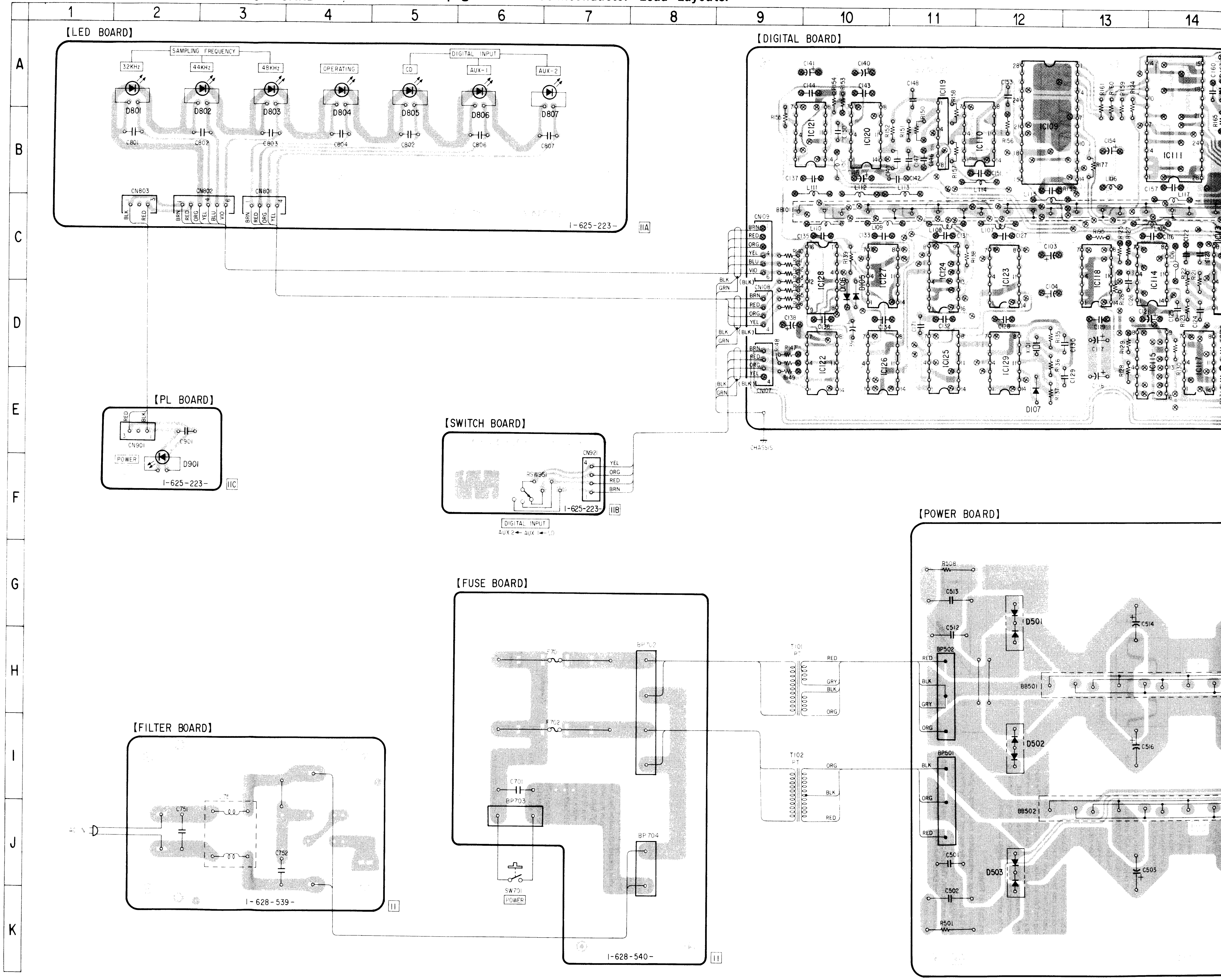
SECTION 3
DIAGRAMS

3-1. PRINTED WIRING BOARD

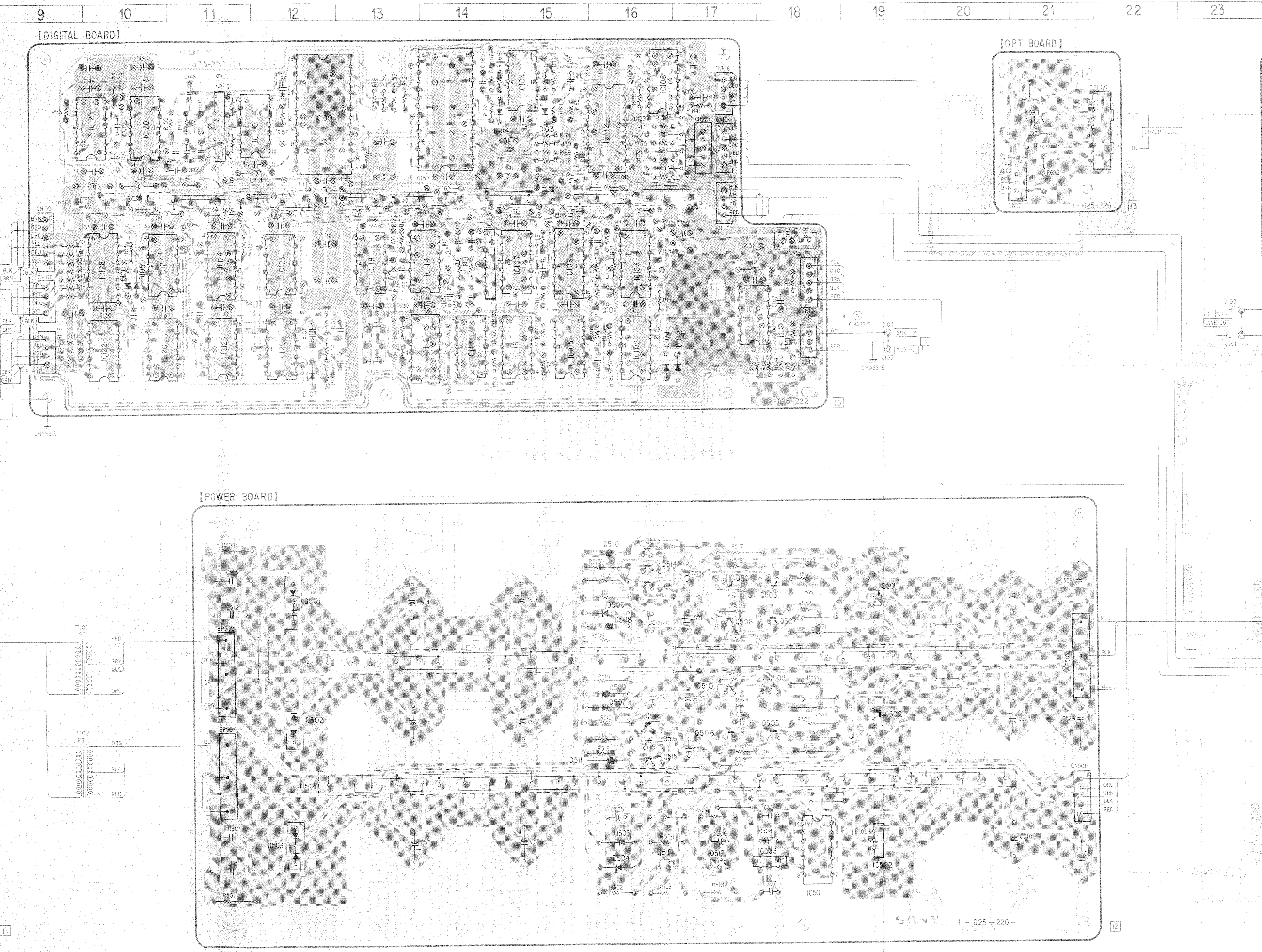
• Refer to page 18 for Semiconductor Lead Layouts.

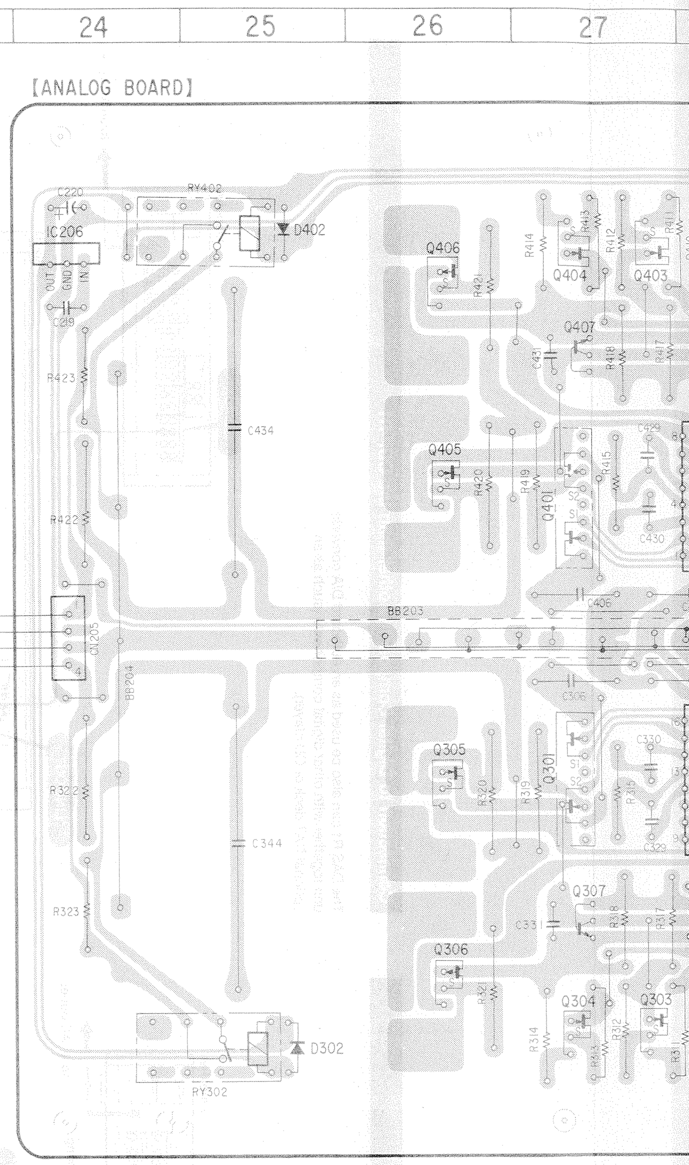
• Semiconductor Location

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
D101	E-16	IC120	B-10	Q505	I-18
D102	E-17	IC121	B-10	Q506	I-17
D103	B-15	IC122	D-10	Q507	H-18
D104	B-14	IC123	C-12	Q508	H-17
D105	D-10	IC124	C-11	Q509	I-18
D106	D-10	IC125	D-11	Q510	I-17
D107	E-12	IC126	D-10	Q511	G-16
D201	B-33	IC127	C-10	Q512	I-16
D301	G-28	IC128	C-10	Q513	G-16
D302	G-25	IC129	D-12	Q514	G-16
D401	B-29	IC201	C-33	Q515	I-16
D402	B-25	IC202	D-33	Q516	I-16
D501	G-12	IC203	B-33	Q517	K-17
D502	I-12	IC204	B-31	Q518	K-16
D503	J-12	IC205	B-31		
D504	K-16	IC206	B-24		
D505	J-16	IC208	F-34		
D506	H-16	IC209	F-33		
D507	I-16	IC301	F-31		
D508	H-16	IC302	E-29		
D509	I-16	IC303	E-29		
D510	G-16	IC304	E-28		
D511	I-16	IC401	C-31		
D801	A-2	IC402	D-29		
D802	A-3	IC403	D-29		
D803	A-3	IC404	C-28		
D804	A-4	IC501	K-18		
D805	A-5	IC502	J-19		
D806	A-6	IC503	K-18		
D807	A-7				
D901	F-2	Q101	D-16		
		Q201	B-30		
IC101	D-17	Q202	B-31		
IC102	D-16	Q301	E-27		
IC103	C-16	Q302	G-28		
IC104	A-15	Q303	G-27		
IC105	D-15	Q304	G-27		
IC106	A-16	Q305	E-26		
IC107	C-15	Q306	F-26		
IC108	C-15	Q307	F-27		
IC109	B-12	Q401	C-27		
IC110	B-12	Q402	B-28		
IC111	B-14	Q403	B-27		
IC112	B-16	Q404	B-27		
IC113	C-14	Q405	C-26		
IC114	C-14	Q406	B-26		
IC115	D-14	Q407	C-27		
IC116	D-15	Q501	G-19		
IC117	D-14	Q502	I-19		
IC118	C-18	Q503	G-18		
IC119	B-11	Q504	G-17		


1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
J
K
【LED BOARD】
SAMPLING FREQUENCY
32KHz
44KHz
48KHz
OPERATING
DIGITAL INPUT
CD
AUX-1
AUX-2
D801
D802
D803
D804
D805
D806
D807
CN803
CN802
CN801
1-625-223-
11A
【DIGITAL BOARD】
IC109
IC110
IC111
IC118
IC114
IC119
IC120
IC121
IC122
IC123
IC124
IC125
IC126
IC127
IC128
IC129
IC115
IC117
CN109
CN108
CN107
D107
CHASSIS
【PL BOARD】
CN901
D901
POWER
1-625-223-
11C
【SWITCH BOARD】
RSW951
CN921
YEL
ORG
RED
BRN
1-625-223-
11B
DIGITAL INPUT
AUX 2 ← AUX 1 ← CD
【FUSE BOARD】
F701
F702
BP702
BP703
BP704
C701
SW701
POWER
1-628-540-
11
【FILTER BOARD】
C751
C752
1-628-539-
11
T101 PT
T102 PT
RED
GRY
BLK
ORG
【POWER BOARD】
R508
C513
C512
C514
D501
BP502
BB501
D502
C516
BP501
BB502
C501
C502
D503
C503
R501

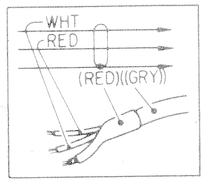
s.


9
10
11
12
13
14
15
16
17
18
19
20
21
22
[DIGITAL BOARD]
SONY
1-625-222-11
1-625-222-
[OPT BOARD]
1-625-226-
OUT
CD/OPTICAL
IN
CHASSIS
AUX-2
AUX-1
IN
[POWER BOARD]
T101
PT
T102
PT
SONY
1-625-220-


23
24
25
26
27
[ANALOG BOARD]
LINE OUT
R
L
J102
J101

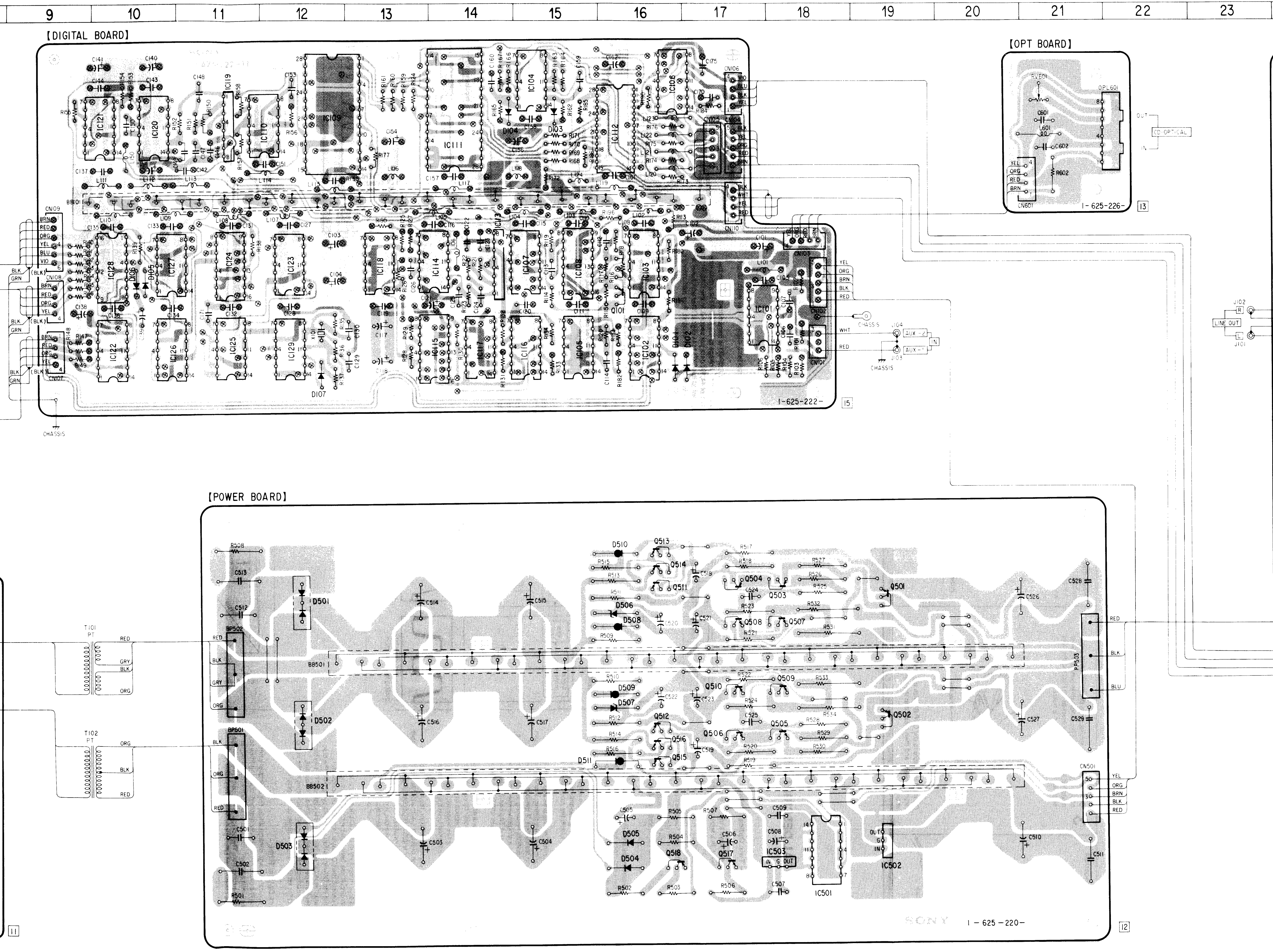
Note on Printed Wiring Board :

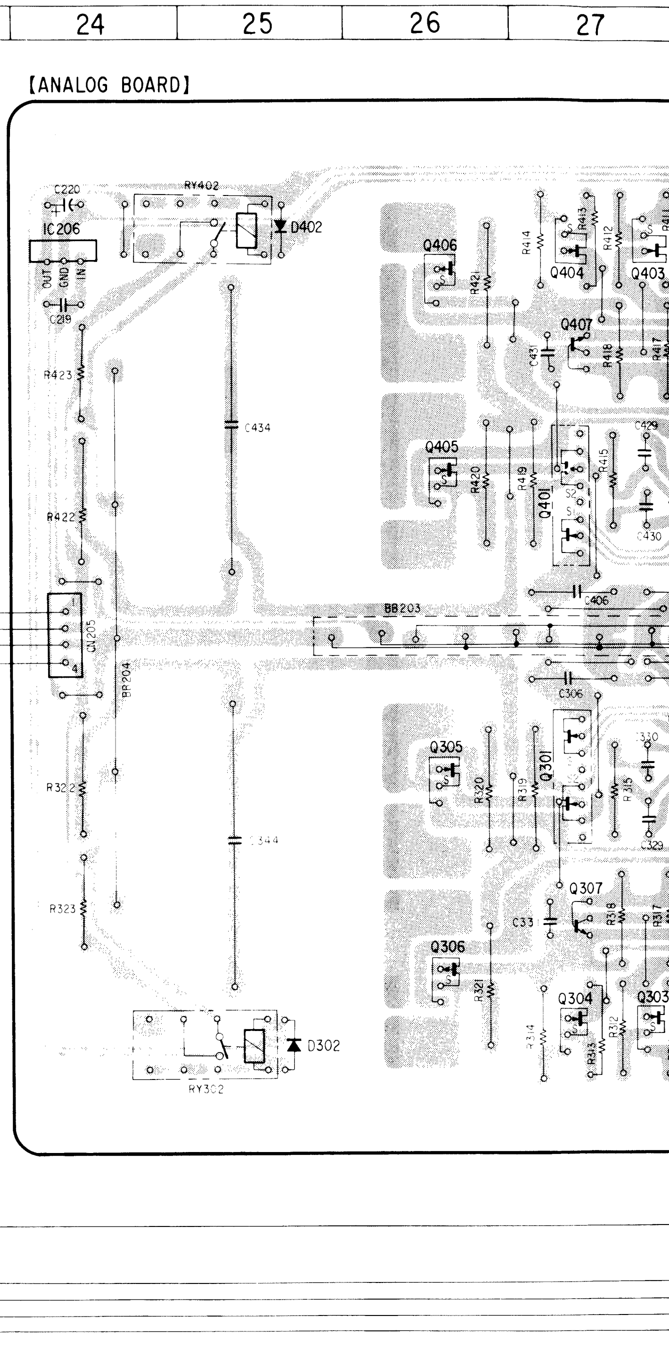
- Color code or sleeving over the end of the jacket.


WHT
RED
(RED)(GRY)

- ○—— : parts extracted from the component side.
- ●—— : parts extracted from the conductor side.
- ⊗ : Through hole.
- ▨ : Pattern on the side which is seen.
- ▨ : Pattern of the component side.
- WG model: West Gemany model

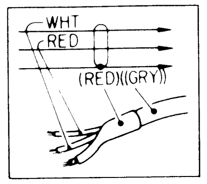
its.


9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
[DIGITAL BOARD]
1-625-222-
15
[OPT BOARD]
1-625-226-
13
CD OPTICAL
OUT
IN
LINE OUT
AUX-2
AUX-1
IN
CHASSIS
[POWER BOARD]
1-625-220-
12
11
T101 PT
T102 PT
RED
GRY
BLK
ORG
BLU
YEL
BRN
WHT
VIO
IC501
IC502
IC503
D501
D502
D503
Q501
Q502


24
25
26
27
[ANALOG BOARD]
RY402
D402
RY302
D302
IC206
Q406
Q404
Q403
Q407
Q405
Q401
Q305
Q301
Q307
Q306
Q304
Q303

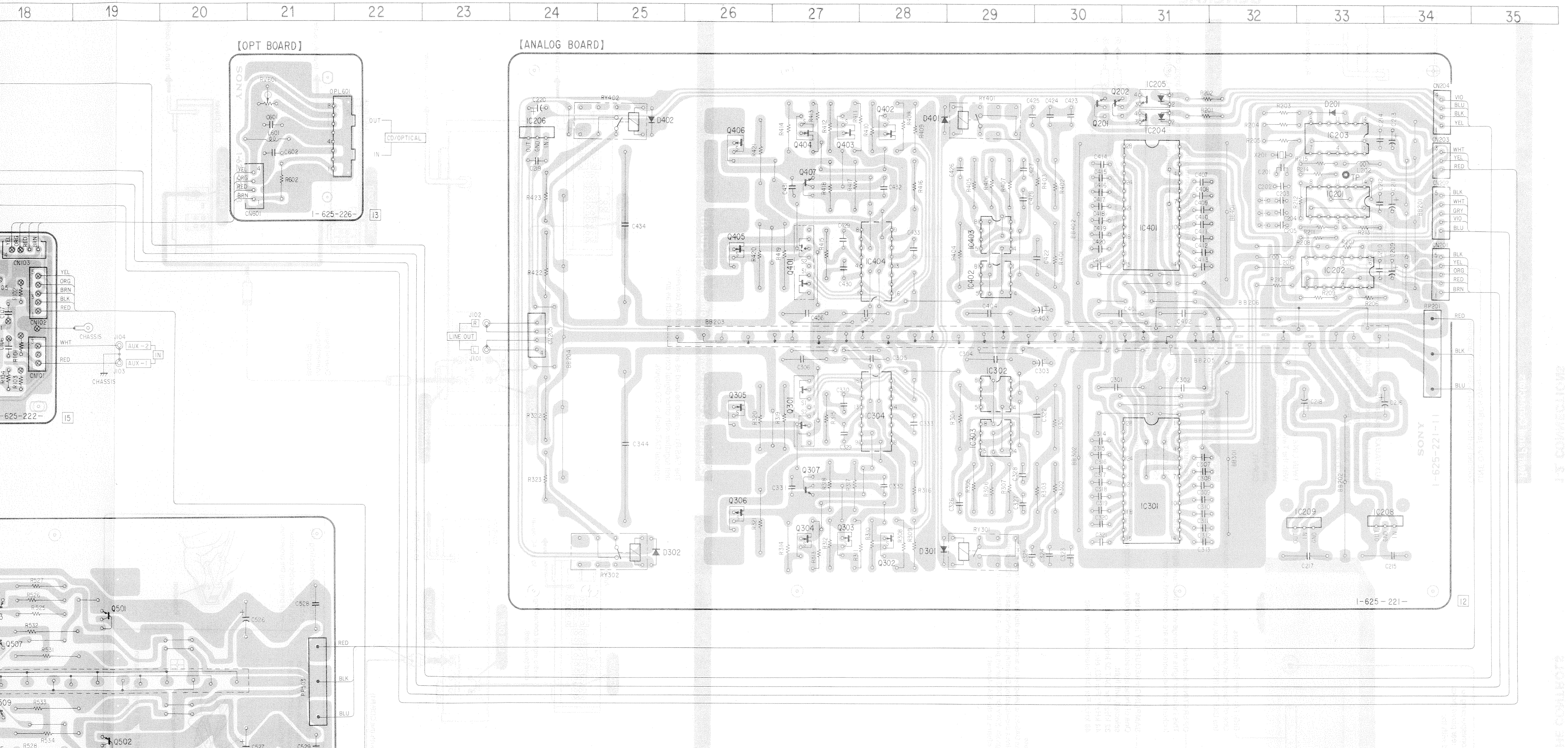
Note on Printed Wiring Board :

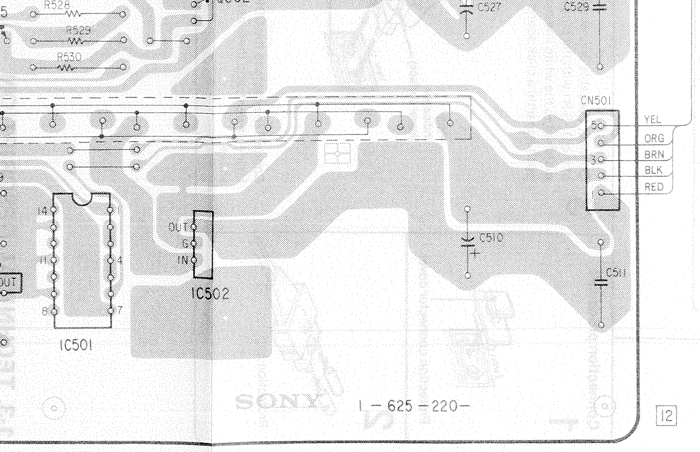
- Color code or sleeving over the end of the jacket.


WHT
RED
(RED)(GRY)

- ○—— : parts extracted from the component side.
- ●—— : parts extracted from the conductor side.
- ⊗ : Through hole.
- ▨ : Pattern on the side which is seen.
- ▨ : Pattern of the component side.

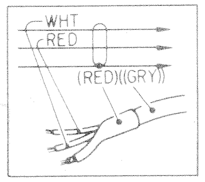
* WG model: West Germany model


18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
[OPT BOARD]
OPL601
CN601
1-625-226-
CD/OPTICAL
OUT
IN
[ANALOG BOARD]
IC206
RY402
D402
RY401
D401
Q202
IC205
Q201
IC204
D201
IC203
IC201
IC202
IC401
IC404
IC403
IC402
IC302
IC303
IC304
IC301
Q406
Q404
Q403
Q402
Q407
Q405
Q401
Q305
Q301
Q307
Q306
Q304
Q303
Q302
D302
RY302
D301
RY301
IC209
IC208
BB203
BB204
BB205
BB206
CN204
CN203
CN202
CN201
BP201
J102
J101
LINE OUT
R
L
AUX-2
AUX-1
IN
J104
J103
CHASSIS
CN103
CN102
CN101
1-625-222-
1-625-221-
SONY
VIO
BLU
BLK
YEL
WHT
RED
GRY
ORG
BRN


Q501
Q502
Q507
IC501
IC502
CN501
BP501
RED
BLK
BLU
YEL
ORG
BRN
SONY
1-625-220-

Note on Printed Wiring Board :

- Color code or sleeving over the end of the jacket.


WHT
RED
(RED)(GRY)

- ○—— : parts extracted from the component side.
- ●—— : parts extracted from the conductor side.
- ⊗ : Through hole.
- ▨ : Pattern on the side which is seen.
- ▨ : Pattern of the component side.
- WG model: West Gemany model

Note on Schematic Diagram :

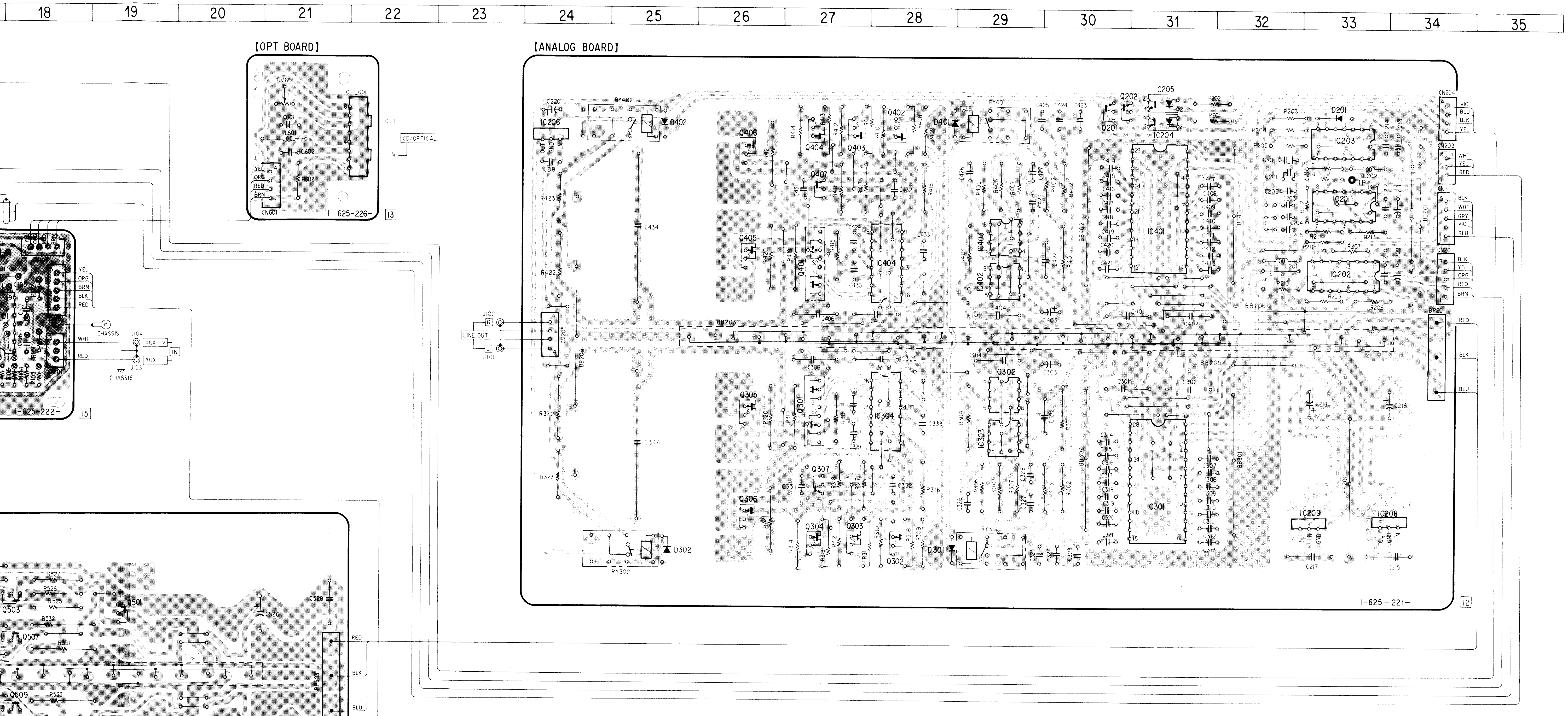
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- Switch

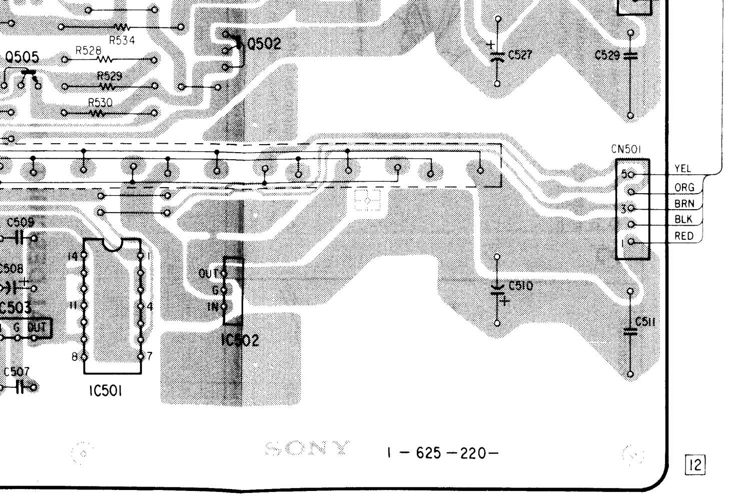
Ref. No.	Switch	Position
SW701	POWER	ON
RSW951	DIGITAL INPUT	CD

- ▬ : B+ bus.
- ▬ ▬ : B− bus.
- ☐ : adjustment for repair.

CD player (CDP-R1,etc) with digital output is required for measurement of this set.

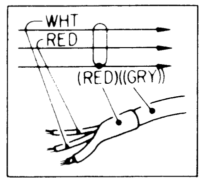
- Play back any compact disc, receive the digital signal.
- Voltages are taken with a VOM (50 kΩ/V).
- Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken to ground in playback mode by using oscilloscope.
- ⇨ : CD signal pass
- ⇨ : L-CH signal pass
- ⇨ : R-CH signal pass
- WG model: West Gemany model


18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
[OPT BOARD]
RV601
OPL601
C601
L601
C602
R602
CN601
OUT
CD/OPTICAL
IN
YEL
ORG
RED
BRN
1-625-226-
13
[ANALOG BOARD]
IC206
RY402
D402
Q406
Q404
Q403
Q402
D401
RY401
Q202
IC205
Q201
IC204
IC203
D201
IC201
IC202
IC401
IC403
IC402
IC404
Q407
Q405
Q401
BB203
BB205
BB206
BB402
BB401
BB201
BP201
CN204
CN203
CN202
CN201
VIO
BLU
BLK
YEL
WHT
RED
GRY
ORG
BRN
TP
J102
J101
R
L
LINE OUT
CN205
BB204
C434
C344
Q305
Q301
IC304
IC302
IC303
IC301
Q307
Q306
Q304
Q303
Q302
D301
RY301
RY302
D302
IC209
IC208
BB301
BB302
BB202
1-625-221-
12
CHASSIS
J104
J103
AUX-2
AUX-1
IN
1-625-222-
15


Q501
Q503
Q507
Q509
Q502
Q505
C526
C527
C528
C529
C510
C511
PP503
RED
BLK
BLU
CN501
YEL
ORG
BRN
BLK
RED
IC501
IC502
SONY
1-625-220-
12

Note on Printed Wiring Board :

- Color code or sleeving over the end of the jacket.


WHT
RED
(RED)((GRY))

- ○—— : parts extracted from the component side.
- ●—— : parts extracted from the conductor side.
- ⊗ : Through hole.
- ▒ : Pattern on the side which is seen.
- Pattern of the component side
- WG model: West Gemany model

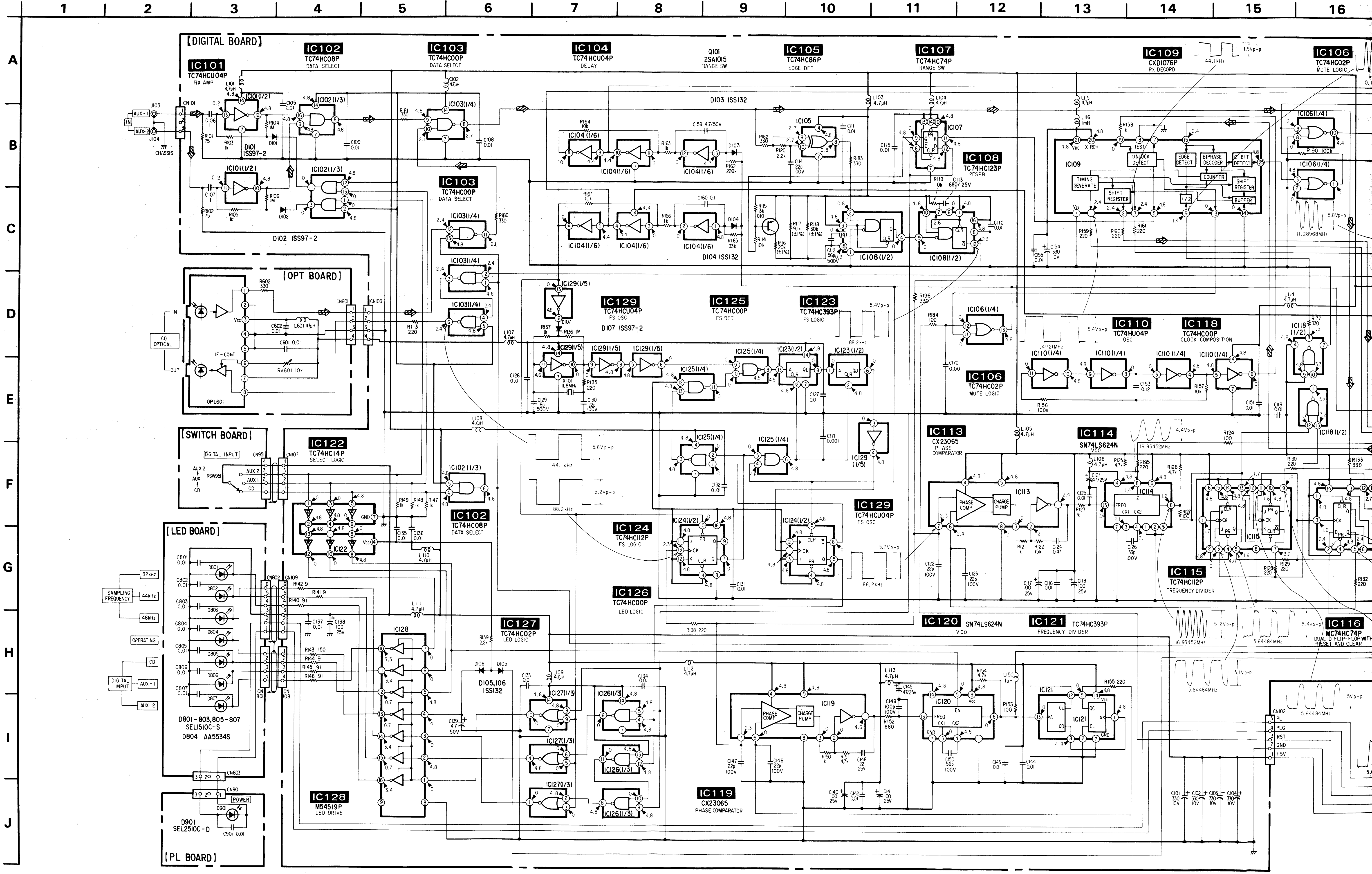
Note on Schematic Diagram :

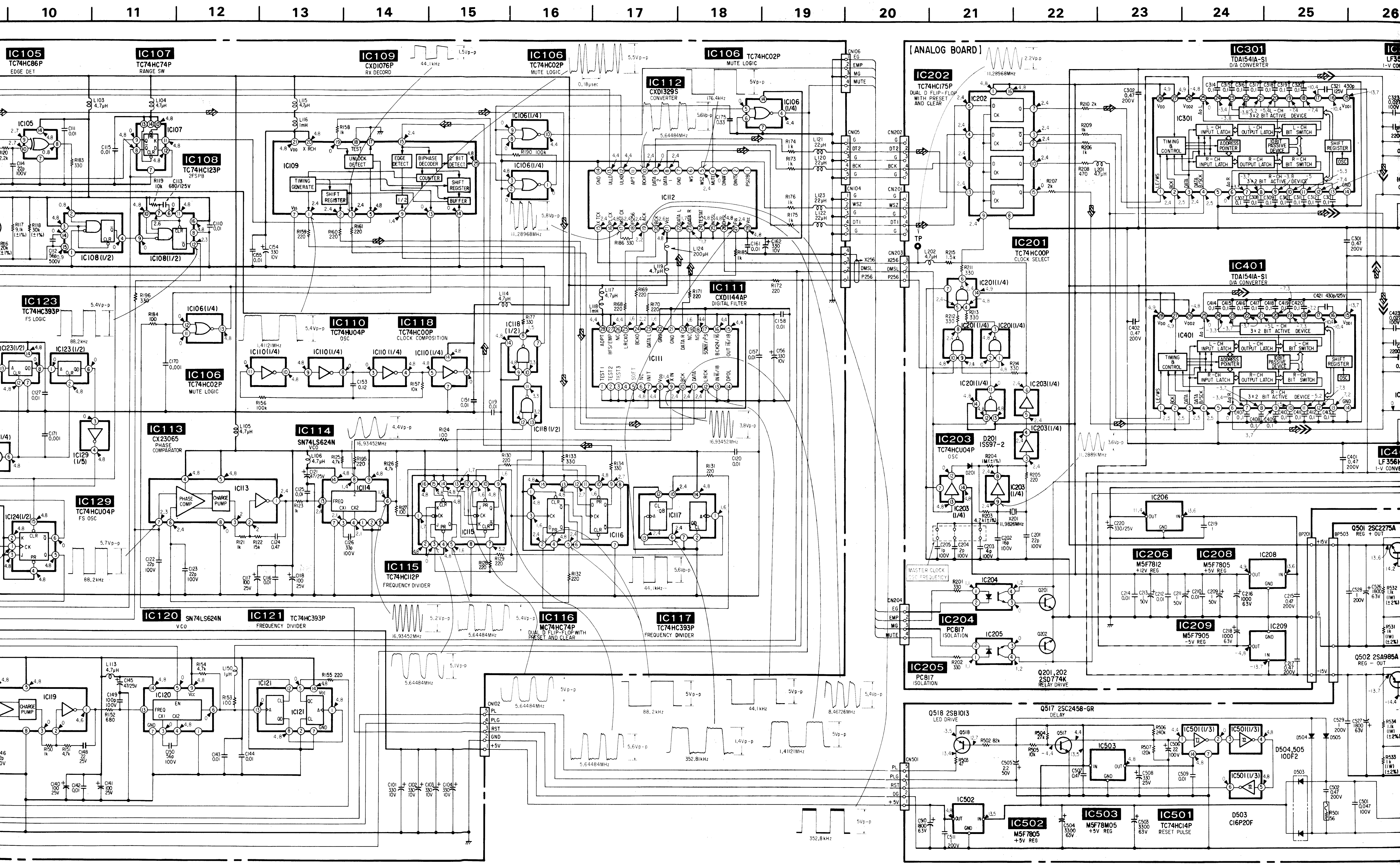
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- Switch

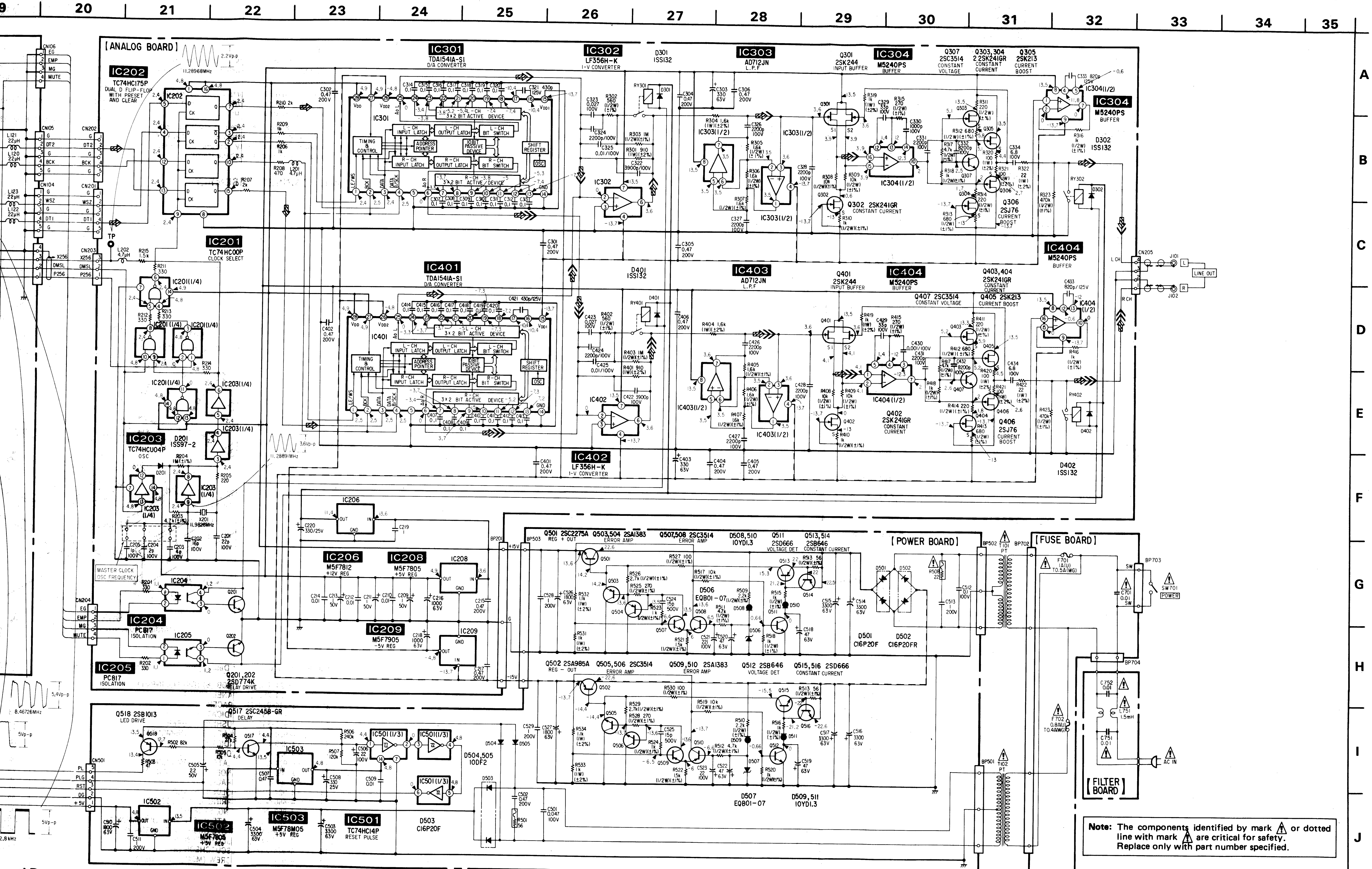
Ref. No.	Switch	Position
SW701	POWER	ON
RSW951	DIGITAL INPUT	CD

- ━━━ : B+ bus.
- ▬ ▬ ▬ : B– bus.
- ☐ : adjustment for repair.
  CD player (CDP-R1,etc) with digital output is required for measurement of this set.
- Play back any compact disc, receive the digital signal.
- Voltages are taken with a VOM (50 kΩ/V)
- Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken to ground in playback mode by using oscilloscope.
- ⇨ : CD signal pass
- ⇨〉 : L-CH signal pass
- ⇨〉〉: R-CH signal pass
- WG model: West Gemany model

3-2. SCHEMATIC DIAGRAM


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
[DIGITAL BOARD]
IC101 TC74HCU04P RX AMP
IC102 TC74HC08P DATA SELECT
IC103 TC74HC00P DATA SELECT
IC104 TC74HCU04P DELAY
Q101 2SA1015 RANGE SW
IC105 TC74HC86P EDGE DET
IC107 TC74HC74P RANGE SW
IC109 CXD1076P RX DECORD
IC106 TC74HC02P MUTE LOGIC
IC108 TC74HC123P 2FSPB
D103 ISS132
D101 ISS97-2
D102 ISS97-2
D104 ISS132
AUX-1
AUX-2
IN
J103
J104
CHASSIS
CN101
[OPT BOARD]
CD OPTICAL
IN
OUT
IF-CONT
RV601 10k
OPL601
CN601
CN103
IC129 TC74HCU04P FS OSC
D107 ISS97-2
IC125 TC74HC00P FS DET
IC123 TC74HC393P FS LOGIC
IC110 TC74HU04P OSC
IC118 TC74HC00P CLOCK COMPOSITION
IC106 TC74HC02P MUTE LOGIC
X101 11.8MHz
[SWITCH BOARD]
DIGITAL INPUT
AUX 2
AUX 1
CD
RSW951
CN951
CN107
IC122 TC74HC14P SELECT LOGIC
IC102 TC74HC08P DATA SELECT
IC124 TC74HC112P FS LOGIC
IC113 CX23065 PHASE COMPARATOR
IC114 SN74LS624N VCO
IC115 TC74HC112P FREQUENCY DIVIDER
IC116 MC74HC74P DUAL D FLIP-FLOP WITH PRESET AND CLEAR
[LED BOARD]
SAMPLING FREQUENCY
32kHz
44kHz
48kHz
OPERATING
DIGITAL INPUT
CD
AUX-1
AUX-2
D801-803,805-807 SEL1510C-S
D804 AA5534S
CN802
CN109
CN801
CN108
IC126 TC74HC00P LED LOGIC
IC127 TC74HC02P LED LOGIC
IC128 M54519P LED DRIVE
D105,106 ISS132
IC120 SN74LS624N VCO
IC121 TC74HC393P FREQUENCY DIVIDER
IC119 CX23065 PHASE COMPARATOR
PHASE COMP
CHARGE PUMP
TIMING GENERATE
SHIFT REGISTER
UNLOCK DETECT
EDGE DETECT
BIPHASE DECODER
BIT DETECT
COUNTER
BUFFER
CN803
CN901
POWER
D901 SEL2510C-D
[PL BOARD]
CN102
PL
PLG
RST
GND
+5V
1.5Vp-p 44.1kHz
5.8Vp-p 11.28968MHz
5.4Vp-p 88.2kHz
5.4Vp-p 1.41121MHz
5.6Vp-p 44.1kHz
5.2Vp-p 88.2kHz
5.7Vp-p 88.2kHz
4.4Vp-p 16.93452MHz
5.2Vp-p 16.93452MHz
5.4Vp-p 5.64484MHz
5.1Vp-p 5.64484MHz
5Vp-p 5.64484MHz

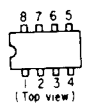

10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
IC105 TC74HC86P EDGE DET
IC107 TC74HC74P RANGE SW
IC108 TC74HC123P 2FSPB
IC109 CXD1076P RX DECORD
IC106 TC74HC02P MUTE LOGIC
IC112 CXD1129S CONVERTER
IC111 CXD1144AP DIGITAL FILTER
IC123 TC74HC393P FS LOGIC
IC110 TC74HU04P OSC
IC118 TC74HC00P CLOCK COMPOSITION
IC113 CX23065 PHASE COMPARATOR
IC114 SN74LS624N VCO
IC129 TC74HCU04P FS OSC
IC115 TC74HC112P FREQUENCY DIVIDER
IC116 MC74HC74P DUAL D FLIP-FLOP WITH PRESET AND CLEAR
IC117 TC74HC393P FREQUENCY DIVIDER
IC120 SN74LS624N VCO
IC121 TC74HC393P FREQUENCY DIVIDER
[ANALOG BOARD]
IC202 TC74HC175P DUAL D FLIP-FLOP WITH PRESET AND CLEAR
IC201 TC74HC00P CLOCK SELECT
IC203 TC74HCU04P OSC
D201 1SS97-2
IC204 PC817 ISOLATION
IC205 PC817 ISOLATION
Q201, 202 2SD774K RELAY DRIVE
IC301 TDA1541A-S1 D/A CONVERTER
IC401 TDA1541A-S1 D/A CONVERTER
TIMING & CONTROL
L-CH INPUT LATCH
L-CH OUTPUT LATCH
R-CH INPUT LATCH
R-CH OUTPUT LATCH
BIT SWITCH
ADDRESS POINTER
10BIT PASSIVE DEVICE
SHIFT REGISTER
OSC
3×2 BIT ACTIVE DEVICE
IC206 M5F7812 +12V REG
IC208 M5F7805 +5V REG
IC209 M5F7905 -5V REG
Q501 2SC2275A REG + OUT
Q502 2SA985A REG - OUT
Q518 2SB1013 LED DRIVE
Q517 2SC2458-GR DELAY
IC502 M5F7805 +5V REG
IC503 M5F78M05 +5V REG
IC501 TC74HC14P RESET PULSE
D503 C16P20F
D504, 505 10DF2
MASTER CLOCK OSC FREQUENCY
CN106 EG EMP MG MUTE
CN105 G DT2 G BCK G
CN104 G WSZ G DT1 G
CN103 X256 DMSL P256
CN202 G DT2 G BCK G
CN201 G WSZ G DT1 G
CN203 X256 DMSL P256
CN204 EG EMP MG MUTE
CN102 PL PLG RST GND +5V
CN501 PL PLG RST DG +5V
44.1kHz
1.5Vp-p
5.5Vp-p
0.18μsec
176.4kHz
5Vp-p
5.6Vp-p
5.64484MHz
11.28968MHz
5.8Vp-p
2.2Vp-p
5.4Vp-p
88.2kHz
1.41121MHz
4.4Vp-p
16.93452MHz
3.8Vp-p
3.6Vp-p
11.2889MHz
5.7Vp-p
5.6Vp-p
5.2Vp-p
5.1Vp-p
8.46726MHz
352.8kHz
1.4Vp-p
11.9826MHz
TP
LF356 I-V CONVERTER


[ANALOG BOARD]
IC202 TC74HC175P DUAL D FLIP-FLOP WITH PRESET AND CLEAR
IC201 TC74HC00P CLOCK SELECT
IC203 TC74HCU04P OSC
D201 1SS97-2
11.2896MHz
11.2896MHz
11.9826MHz
MASTER CLOCK OSC FREQUENCY
IC301 TDA1541A-S1 D/A CONVERTER
IC302 LF356H-K I-V CONVERTER
D301 1SS132
IC303 AD712JN L.P.F
Q301 2SK244 INPUT BUFFER
IC304 M5240PS BUFFER
Q307 2SC3514 CONSTANT VOLTAGE
Q303,304 2 2SK241GR CONSTANT CURRENT
Q305 2SK213 CURRENT BOOST
Q302 2SK241GR CONSTANT CURRENT
Q306 2SJ76 CURRENT BOOST
D302 1SS132
IC401 TDA1541A-S1 D/A CONVERTER
IC402 LF356H-K I-V CONVERTER
D401 1SS132
IC403 AD712JN L.P.F
Q401 2SK244 INPUT BUFFER
IC404 M5240PS BUFFER
Q407 2SC3514 CONSTANT VOLTAGE
Q403,404 2SK241GR CONSTANT CURRENT
Q405 2SK213 CURRENT BOOST
Q402 2SK241GR CONSTANT CURRENT
Q406 2SJ76 CURRENT BOOST
D402 1SS132
LINE OUT
IC206 M5F7812 +12V REG
IC208 M5F7805 +5V REG
IC209 M5F7905 -5V REG
IC204 PC817 ISOLATION
IC205 PC817 ISOLATION
Q201,202 2SD774K RELAY DRIVE
[POWER BOARD]
Q501 2SC2275A REG + OUT
Q503,504 2SA1383 ERROR AMP
Q507,508 2SC3514 ERROR AMP
D508,510 10YD1.3
Q511 2SD666 VOLTAGE DET
Q513,514 2SB646 CONSTANT CURRENT
D506 EQB01-07
D501 C16P20F
D502 C16P20FR
Q502 2SA985A REG - OUT
Q505,506 2SC3514 ERROR AMP
Q509,510 2SA1383 ERROR AMP
Q512 2SB646 VOLTAGE DET
Q515,516 2SD666 CONSTANT CURRENT
D507 EQB01-07
D509,511 10YD1.3
[FUSE BOARD]
F701 1A(U) T0.5A(WG)
F702 0.8A(U) T0.4A(WG)
SW701 POWER
AC IN
[FILTER BOARD]
Q518 2SB1013 LED DRIVE
Q517 2SC2458-GR DELAY
IC501 TC74HC14P RESET PULSE
IC502 M5F7805 +5V REG
IC503 M5F78M05 +5V REG
D503 C16P20F
D504,505 10DF2

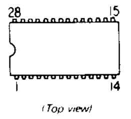
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

- Semiconductor Lead Layouts

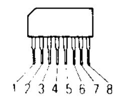
AD712JN


8 7 6 5
1 2 3 4
(Top view)

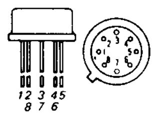
CXD1076P
CXD1144AP
CXD1329S
TDA1541A-S1


28
15
1
14
(Top view)

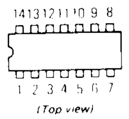
CX23065



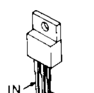
LF356H-K



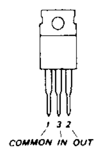
MC74HC74N
SN74LS624N
TC74HCU04P
TC74HC00P
TC74HC02P
TC74HC08P
TC74HC393P


14 13 12 11 10 9 8
1 2 3 4 5 6 7
(Top view)

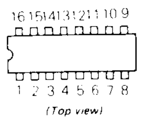
M5F78M05
M5F7805
M5F7812



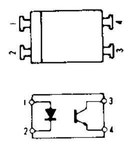
M5F7905


1 2 3
COMMON IN OUT

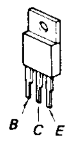
M5240PS
M54519P
TC74HC112P
TC74HC123P
TC74HC14P
TC74HC175P
TC74HC86P


16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
(Top view)

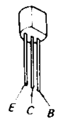
PC817



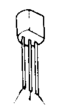
2SA985
2SA1383
2SC2275
2SC3514



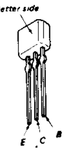
2SA1015
2SB1013



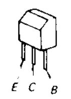
2SB646-B
2SD666-B



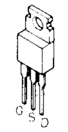
2SC2785


letter side
E C B

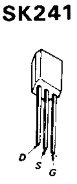
2SD774



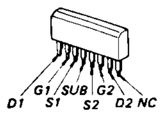
2SJ76
2SK213



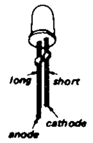
2SK241-GR



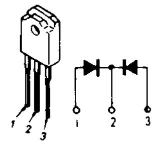
2SK244


G1 SUB G2
D1 S1 S2 D2 NC

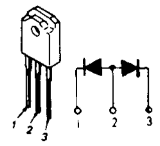
AA5534S


long
short
cathode
anode

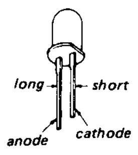
C16P20F



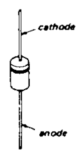
C16P20FR



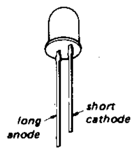
SEL1510C-S


long
short
anode
cathode

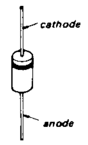
EQB01-07
10DF6


cathode
anode

SEL2501C-D


long anode
short cathode

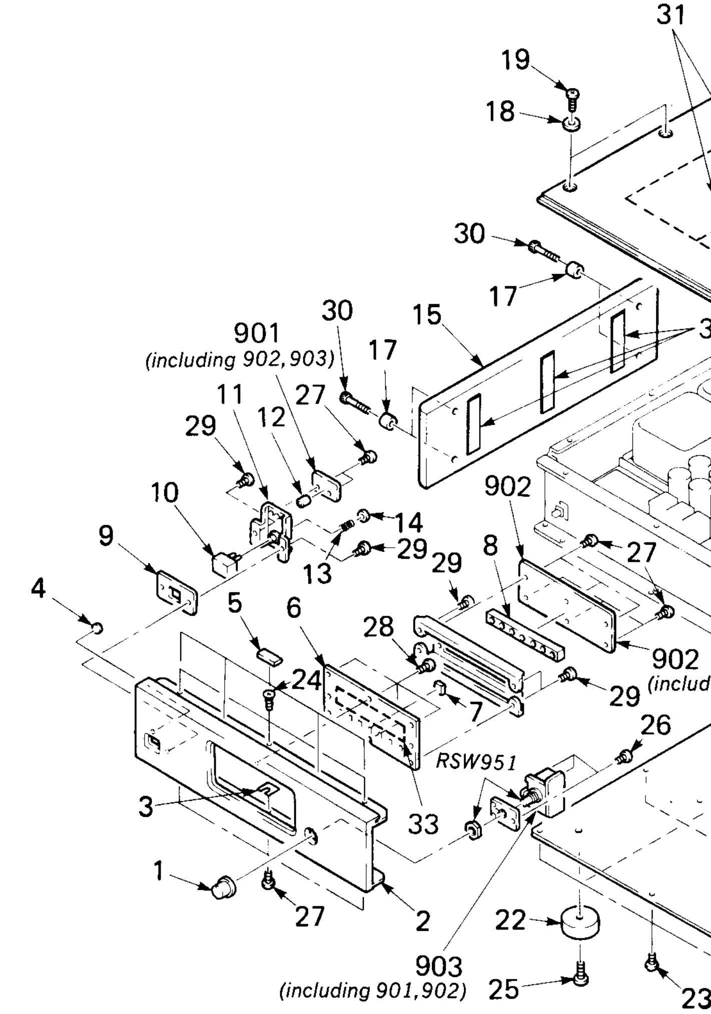
1SS132
1SS97-2
10YD1.3-A


cathode
anode

SECTION 4
EXPLODED VIEW

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, part
number suffix -XX and -X
ferent from the parts speci
components used on the set.
- Color Indication of Appea
Example:
(RED) . . . KNOB, BALANC
↑
Cabinet's Color

4-1. CABINET ASSEMBLY


31
19
18
30
17
15
901
(including 902,903)
30
17
11
27
29
12
10
14
29
902
9
13
29
8
27
4
5
6
28
902
(includ
24
7
29
26
RSW951
3
33
1
27
2
22
903
(including 901,902)
25
23

Ref.No	Part No.	Description	Remarks
1	4-924-256-01	KNOB (B) (DIGITAL INPUT)	
2	4-924-252-01	PANEL, FRONT	
3	3-544-028-11	SPACER	
4	4-924-233-01	INDICATOR	
5	9-911-840-XX	CUSHION, RUBBER	
6	4-924-253-01	PLATE (B), ORNAMENTAL	
7	★4-889-622-01	INDICATOR	
8	★4-924-254-01	HOLDER (B), LED	
9	★4-924-245-01	PLATE (E), ORNAMENTAL	
10	X-4924-201-1	KNOB (A) ASSY (POWER)	
11	★X-4924-202-1	BRACKET (E) ASSY	
12	★4-924-218-01	HOLDER (A), LED	
13	4-880-426-00	SPRING, COMPRESSION	
14	4-862-338-00	RING, STOPPER	
15	4-924-239-01	PLATE (LEFT), SIDE, ORNAMENTAL	
16	4-924-240-01	PLATE (RIGHT),SIDE, ORNAMENTAL	
17	4-924-241-01	ESCUTCHEON (B)	
18	4-924-237-01	ESCUTCHEON (A)	
19	4-924-242-01	SCREW (M3X6), FLAT HEAD	

Ref.No
20
21
22
23
24
25
26
27
28
29
30
31
32
33
901
902
903
RSW95

SECTION 4
EXPLODED VIEWS

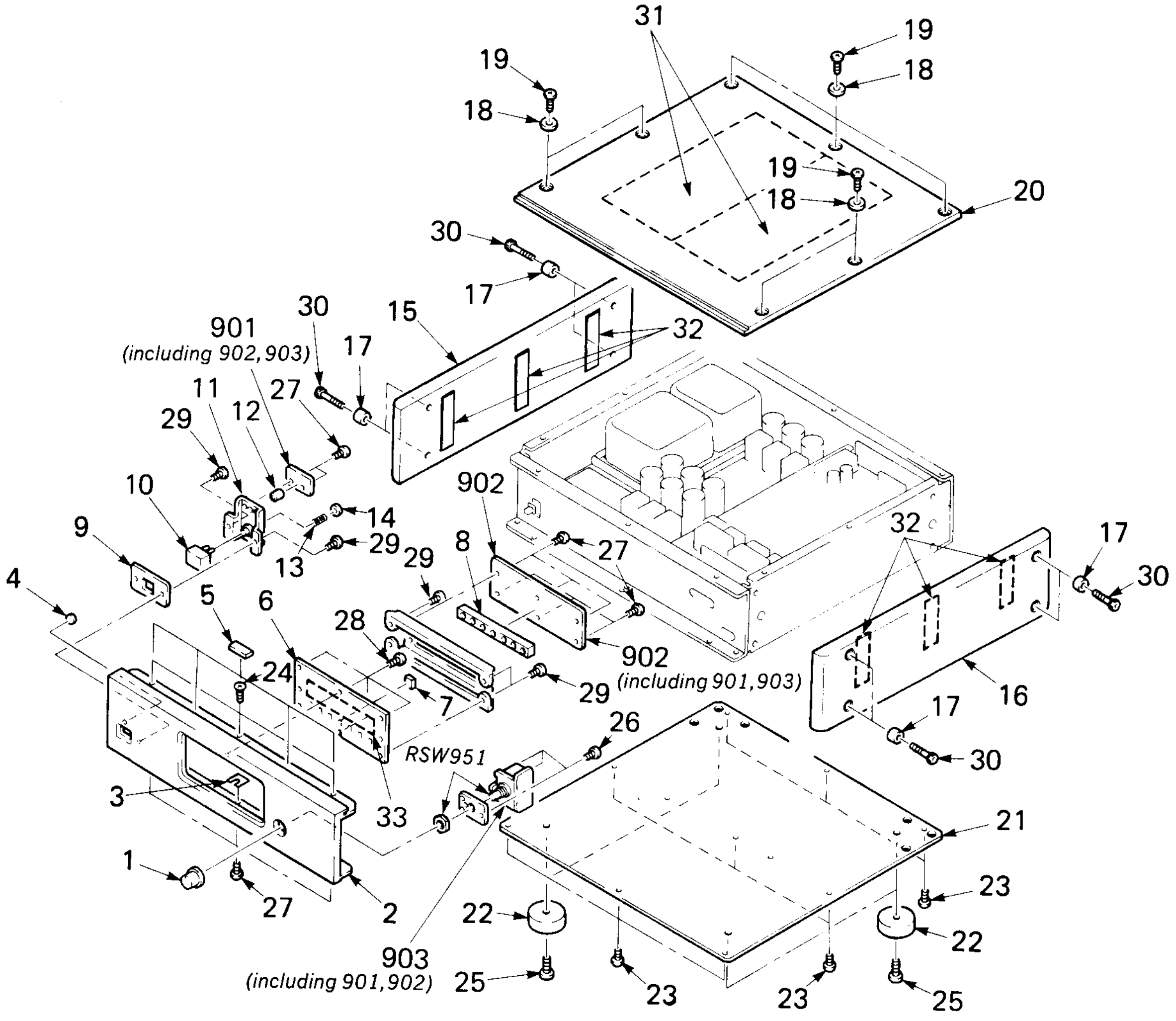
NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts Example:
  (RED) . . . KNOB, BALANCE (WHITE)
  ↑ ↑
  Cabinet's Color Parts Color

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

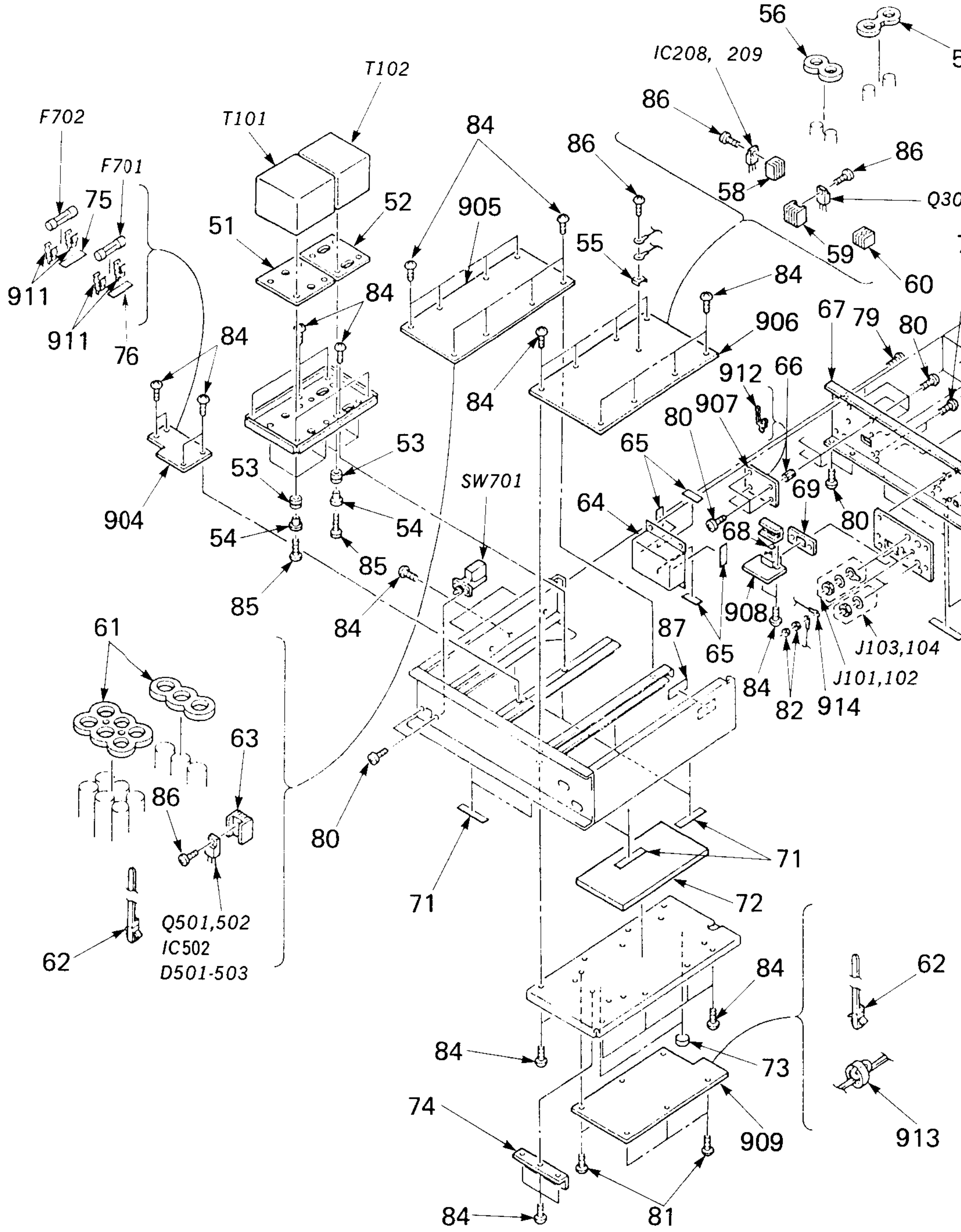
- WG model: West Gemany model

4-1. CABINET ASSEMBLY

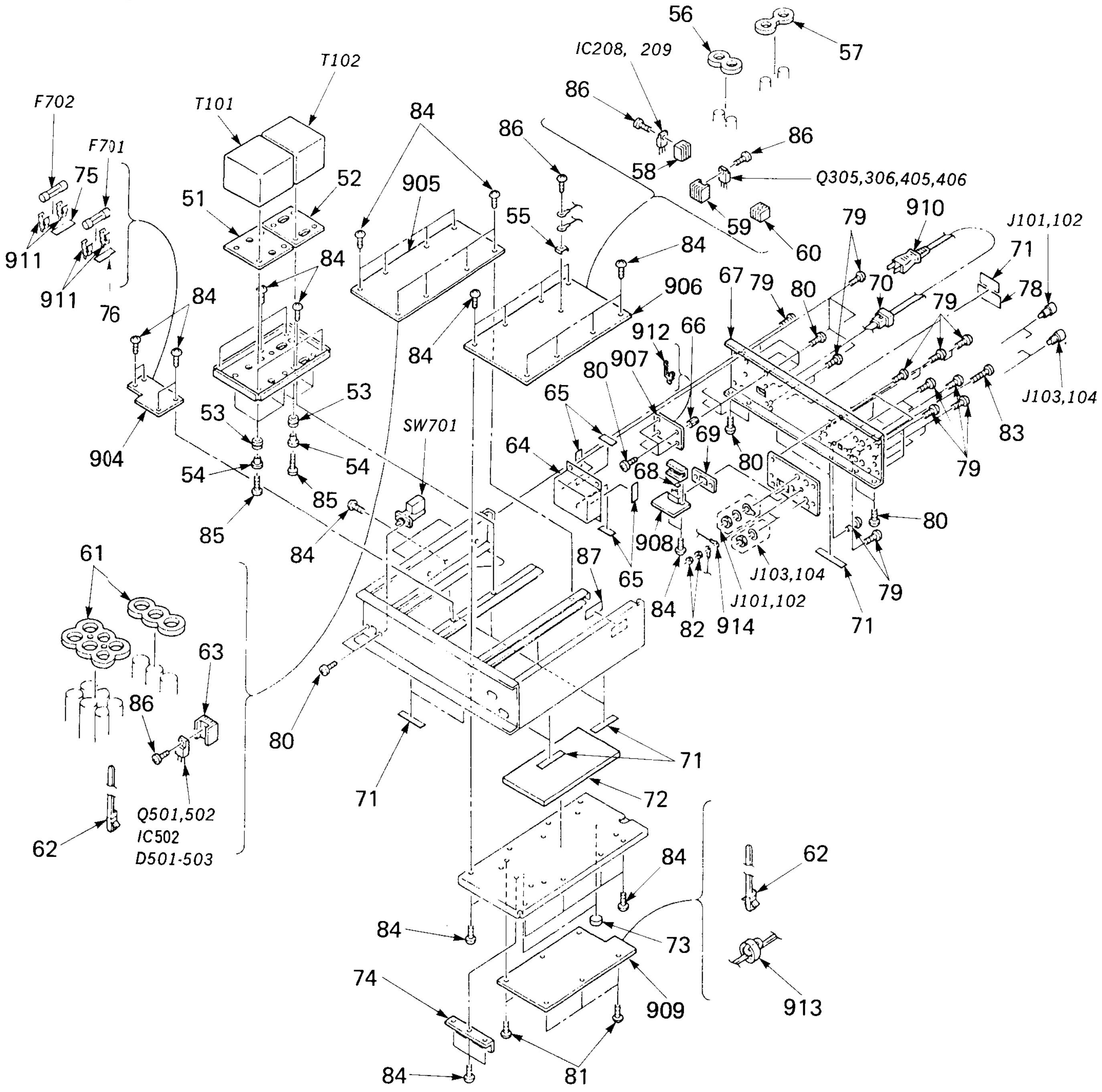

31
19
18
19
18
19
18
20
30
17
15
32
30
17
901
(including 902,903)
11
27
29
12
10
14
29
13
9
4
5
6
24
28
8
902
27
29
32
17
30
902
(including 901,903)
29
7
16
17
30
RSW951
26
3
33
21
1
27
2
22
23
22
903
(including 901,902)
25
23
23
25

Ref.No	Part No.	Description	Remarks
1	4-924-256-01	KNOB (B) (DIGITAL INPUT)	
2	4-924-252-01	PANEL, FRONT	
3	3-544-028-11	SPACER	
4	4-924-233-01	INDICATOR	
5	9-911-840-XX	CUSHION, RUBBER	
6	4-924-253-01	PLATE (B), ORNAMENTAL	
7	★4-889-622-01	INDICATOR	
8	★4-924-254-01	HOLDER (B), LED	
9	★4-924-245-01	PLATE (E), ORNAMENTAL	
10	X-4924-201-1	KNOB (A) ASSY (POWER)	
11	★X-4924-202-1	BRACKET (E) ASSY	
12	★4-924-218-01	HOLDER (A), LED	
13	4-880-426-00	SPRING, COMPRESSION	
14	4-862-338-00	RING, STOPPER	
15	4-924-239-01	PLATE (LEFT), SIDE, ORNAMENTAL	
16	4-924-240-01	PLATE (RIGHT),SIDE, ORNAMENTAL	
17	4-924-241-01	ESCUTCHEON (B)	
18	4-924-237-01	ESCUTCHEON (A)	
19	4-924-242-01	SCREW (M3X6), FLAT HEAD	
20	4-924-236-01	PANEL	
21	★4-924-238-11	PLATE, BOTTOM	
22	X-4924-207-1	FOOT ASSY	
23	3-703-685-21	SCREW (+BV 3X8)	
24	7-682-246-04	SCREW +K 3X5	
25	7-682-566-09	SCREW +B 4X20	
26	7-621-775-10	SCREW +P 2.6X4	
27	7-682-548-09	SCREW (3X8)	
28	7-682-545-04	SCREW +B 3X4	
29	7-682-546-09	SCREW +B 3X5	
30	7-683-425-04	BOLT,HEXAGON SOCKET 4X20	
31	★4-924-265-01	ABSORBENT (A), ACOUSTIC	
32	★4-923-409-01	SPACER	
33	★4-924-272-01	ABSORBENT (C), ACOUSTIC	
901	★1-625-223-11	PC BOARD, PL	
902	★1-625-223-11	PC BOARD, LED	
903	★1-625-223-11	PC BOARD, SWITCH	
RSW951	1-571-372-11	SWITCH, ROTARY (DIGITAL INPUT)	

4-2. CHASSIS ASSEMBLY


56
IC208, 209
86
58
86
Q30
59
60
T102
T101
F702
F701
75
911
911
76
51
52
905
84
86
55
84
84
906
67
79
80
84
912
66
80
907
65
64
69
68
80
904
53
54
85
53
54
85
84
SW701
908
65
87
J103,104
J101,102
84
82
914
61
63
86
Q501,502
IC502
D501-503
80
71
71
72
62
62
84
84
73
74
909
913
84
81

4-2. CHASSIS ASSEMBLY


56
57
IC208, 209
T102
86
F702
T101
84
86
F701
75
58
86
52
905
51
Q305,306,405,406
911
55
79
910
J101,102
59
60
84
84
71
911
76
906
67
79
80
70
78
84
79
912
66
907
80
84
53
65
J103,104
83
53
SW701
64
69
904
54
68
80
54
79
85
85
84
80
61
87
908
65
J103,104
79
63
84
J101,102
82
914
71
86
80
71
71
72
Q501,502
IC502
D501-503
62
84
62
84
73
74
909
913
84
81

Ref.No	Part No.	Description	Remarks
51	*4-924-209-01	CUSHION (A)	
52	*4-924-210-01	CUSHION (B)	
53	*4-888-798-00	BUSHING, RUBBER	
54	4-924-211-01	COLLAR	
55	4-924-264-01	TERMINAL, MOUNT	
56	*4-924-270-01	DAMPER (G)	
57	*4-924-269-01	DAMPER (F)	
58	*4-027-606-01	HEAT SINK (TO-220 TYPE)	
59	*4-363-146-00	HEAT SINK, V.OUT	
60	2-269-798-01	HEAT SINK, TO-39	
61	*4-924-268-01	DAMPER (E)	
62	3-704-208-01	BAND, BINDING	
63	*4-921-402-01	HEAT SINK	
64	*4-924-277-01	CASE, SHIELD	
65	*4-919-204-01	CUSHION (F), CHASSIS	
66	*4-924-280-01	BOSS (E)	
67	*4-924-278-01	PANEL (D), BACK	
68	9-911-863-XX	SPACER	
69	*4-924-226-01	PLATE (L), ORNAMENTAL	
70	4-916-783-01	BUSHING, CORD	
71	*4-923-409-01	SPACER	
72	*4-924-271-01	ABSORBENT (B), ACOUSTIC	
73	*4-924-267-01	DAMPER (C)	
74	*4-924-274-01	REINFORCEMENT	
75	*3-701-946-09	(US)....LABEL, FUSE (0.8A 250V)	
75	*3-701-948-10	(WG)....LABEL, FUSE (T400mA)	
76	*3-701-946-10	(US)....LABEL, FUSE (1A 250V)	
76	*3-701-948-11	(WG)....LABEL, FUSE (T500mA)	
77	3-703-845-01	(US)....LABEL (N) (U/C), MAIN CAUTION	
78	*4-924-283-01	(US)....LABEL, MODEL NUMBER (U2)	
78	*4-924-284-01	(WG)....LABEL, MODEL NUMBER	
79	3-703-685-21	SCREW (+BV 3X8)	
80	7-682-547-09	SCREW +B 3X6	
81	7-682-546-09	SCREW +B 3X5	
82	7-684-023-04	N 3, TYPE 2	
83	7-682-550-09	SCREW +B 3X12	
84	7-682-548-09	SCREW (3X8)	
85	7-682-563-09	SCREW +B 4X12	
86	7-682-148-15	SCREW, TR	
87	*3-701-030-00	LABEL, SERIAL NUMBER	
904	*1-628-540-11	PC BOARD, FUSE	
905	*A-4394-510-A	MOUNTED PCB, POWER	
906	*A-4385-325-A	MOUNTED PCB, ANALOG	
907	*1-628-539-11	PC BOARD, FILTER	
908	*1-625-226-11	PC BOARD, OPT	
909	*A-4382-364-A	MOUNTED PCB, DIGITAL	
910	⚠.1-559-271-11	(WG)....CORD, POWER	
910	⚠.1-559-479-11	(US)....CORD, POWER	
911	1-533-183-11	(WG)....HOLDER, FUSE	
912	*1-535-476-11	TERMINAL	
913	1-543-140-00	CORE, RING	
914	1-559-812-12	LEAD (WITH TERMINAL)	
F701	⚠.1-532-265-XX	(US)....FUSE, GLASS TUBE (1A)	
F701	⚠.1-532-279-00	(WG)....FUSE, TIME-LAG (T500mA)	
F702	⚠.1-532-066-00	(WG)....FUSE, TIME-LAG (T400mA)	
F702	⚠.1-532-401-XX	(US)....FUSE, GLASS TUBE (0.8A)	
J101	1-507-918-00	JACK, PIN 1P (LINE OUT)	
J102	1-507-918-00	JACK, PIN 1P (LINE OUT)	
J103	1-565-064-11	JACK, PIN 1P (AUX1)	
J104	1-565-064-11	JACK, PIN 1P (AUX2)	
SW701	⚠1-571-250-11	SWITCH, PUSH (AC POWER)(1 KEY)	
T101	⚠.1-449-427-11	(WG)....TRANSFORMER, POWER	
T101	⚠.1-449-429-11	(US)....TRANSFORMER, POWER	
T102	⚠.1-449-428-11	(WG)....TRANSFORMER, POWER	
T102	⚠.1-449-430-11	(US)....TRANSFORMER, POWER	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SECTION 5
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: μF, PF: μμF.

RESISTORS
- All resistors are in ohms.
- F: nonflammable

COILS
- MMH: mH, UH: μH

SEMICONDUCTORS
In each case, U: μ, for example:
UA...: μA..., UPA...: μPA...,
UPC...: μPC, UPD...: μPD...

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- WG model: West Gemany model

Ref.No	Part No.	Description
901	★1-625-223-11	PC BOARD, PL
902	★1-625-223-11	PC BOARD, LED
903	★1-625-223-11	PC BOARD, SWITCH
904	★1-628-540-11	PC BOARD, FUSE
905	★A-4394-510-A	MOUNTED PCB, POWER
906	★A-4385-325-A	MOUNTED PCB, ANALOG
907	★1-628-539-11	PC BOARD, FILTER
908	★1-625-226-11	PC BOARD, OPT
909	★A-4382-364-A	MOUNTED PCB, DIGITAL
910	⚠1-559-479-11	(US)....CORD, POWER
910	⚠1-559-271-11	(WG)....CORD, POWER
911	1-553-183-11	(WG)....HOLDER, FUSE
912	★1-535-476-11	TERMINAL
913	1-543-140-00	CORE, RING
914	1-559-812-12	LEAD (WITH TERMINAL)
BB101	1-565-062-11	BAR, BUS
BB201	★1-566-959-11	BAR, BUS
BB202	★4-913-106-01	REINFORCEMENT (C), PWB
BB203	1-565-063-11	BAR, BUS
BB204	★4-908-951-01	REINFORCEMENT (B), PWB
BB205	★1-560-242-11	BUS BAR 3P
BB301	★4-913-106-01	REINFORCEMENT (C), PWB
BB302	★4-913-106-01	REINFORCEMENT (C), PWB
BB401	★4-913-106-01	REINFORCEMENT (C), PWB
BB402	★4-913-106-01	REINFORCEMENT (C), PWB
BB501	1-565-063-11	BAR, BUS
BB502	1-565-063-11	BAR, BUS
BP201	★1-535-140-00	BASE POST 22MM (10MM PITCH) 3P
BP501	★1-535-140-00	BASE POST 22MM (10MM PITCH) 3P
BP502	★1-535-140-00	BASE POST 22MM (10MM PITCH) 3P
BP503	★1-535-140-00	BASE POST 22MM (10MM PITCH) 3P
BP702	★1-535-141-00	BASE POST 22MM (10MM PITCH) 4P
BP703	★1-535-139-00	BASE POST 22MM (10MM PITCH) 2P
BP704	★1-535-139-00	BASE POST 22MM (10MM PITCH) 2P

CAPACITOR

Ref.No	Part No.	Description			
C101	1-124-141-00	ELECT	330MF	20%	10V
C102	1-124-141-00	ELECT	330MF	20%	10V
C103	1-124-141-00	ELECT	330MF	20%	10V
C104	1-124-141-00	ELECT	330MF	20%	10V
C105	1-136-153-00	FILM	0.01MF	5%	50V
C106	1-136-177-00	FILM	1MF	5%	50V
C107	1-136-177-00	FILM	1MF	5%	50V
C108	1-136-153-00	FILM	0.01MF	5%	50V
C109	1-136-153-00	FILM	0.01MF	5%	50V
C110	1-136-153-00	FILM	0.01MF	5%	50V
C111	1-136-153-00	FILM	0.01MF	5%	50V
C112	1-109-667-11	MICA	56PF	1%	500V
C113	1-104-150-00	POLYSTYRENE	680PF	5%	125V
C114	1-107-210-00	MICA	22PF	5%	500V
C115	1-136-153-00	FILM	0.01MF	5%	50V
C116	1-136-153-00	FILM	0.01MF	5%	50V
C117	1-123-333-00	ELECT	100MF	20%	25V
C118	1-123-333-00	ELECT	100MF	20%	25V
C119	1-136-153-00	FILM	0.01MF	5%	50V
C120	1-136-153-00	FILM	0.01MF	5%	50V
C121	1-123-332-00	ELECT	47MF	20%	25V
C122	1-107-210-00	MICA	22PF	5%	500V
C123	1-107-210-00	MICA	22PF	5%	500V
C124	1-136-173-00	FILM	0.47MF	5%	50V
C125	1-136-153-00	FILM	0.01MF	5%	50V
C126	1-107-159-00	MICA	33PF	5%	500V
C127	1-136-153-00	FILM	0.01MF	5%	50V
C128	1-136-153-00	FILM	0.01MF	5%	50V
C129	1-107-208-00	MICA	18PF	5%	500V
C130	1-107-210-00	MICA	22PF	5%	500V
C131	1-136-153-00	FILM	0.01MF	5%	50V
C132	1-136-153-00	FILM	0.01MF	5%	50V
C133	1-136-153-00	FILM	0.01MF	5%	50V
C134	1-136-153-00	FILM	0.01MF	5%	50V
C135	1-136-153-00	FILM	0.01MF	5%	50V
C136	1-136-153-00	FILM	0.01MF	5%	50V
C137	1-136-153-00	FILM	0.01MF	5%	50V
C138	1-123-333-00	ELECT	100MF	20%	25V
C139	1-123-369-00	ELECT	4.7MF	20%	50V
C140	1-123-333-00	ELECT	100MF	20%	25V
C141	1-123-333-00	ELECT	100MF	20%	25V
C142	1-136-153-00	FILM	0.01MF	5%	50V
C143	1-136-153-00	FILM	0.01MF	5%	50V
C144	1-136-153-00	FILM	0.01MF	5%	50V
C145	1-123-332-00	ELECT	47MF	20%	25V
C146	1-107-210-00	MICA	22PF	5%	500V
C147	1-107-210-00	MICA	22PF	5%	500V
C148	1-124-282-00	ELECT	22MF	20%	25V
C149	1-107-169-00	MICA	100PF	5%	500V
C150	1-107-165-00	MICA	56PF	5%	500V
C151	1-136-153-00	FILM	0.01MF	5%	50V
C153	1-136-166-00	FILM	0.12MF	5%	50V
C154	1-124-141-00	ELECT	330MF	20%	10V
C155	1-136-153-00	FILM	0.01MF	5%	50V
C156	1-124-141-00	ELECT	330MF	20%	10V
C157	1-136-153-00	FILM	0.01MF	5%	50V
C158	1-136-153-00	FILM	0.01MF	5%	50V
C159	1-124-274-00	ELECT	4.7MF	20%	50V
C160	1-136-165-00	FILM	0.1MF	5%	50V
C161	1-136-153-00	FILM	0.01MF	5%	50V
C162	1-124-141-00	ELECT	330MF	20%	10V
C170	1-130-471-00	MYLAR	0.001MF	5%	50V
C171	1-130-471-00	MYLAR	0.001MF	5%	50V
C175	1-136-171-00	FILM	0.33MF	5%	50V
C201	1-109-808-11	MICA	22PF	2%	100V
C202	1-107-207-00	MICA	16PF	5%	100V
C203	1-109-823-11	MICA	4PF	0.5PF	100V

Ref.No	Part No.	Description			
C204	1-109-822-11	MICA	2PF	0.5PF	100V
C205	1-109-821-11	MICA	1PF	0.5PF	100V
C209	1-131-450-00	TANTALUM	1MF	20%	50V
C210	1-136-153-00	FILM	0.01MF	5%	50V
C211	1-131-450-00	TANTALUM	1MF	20%	50V
C212	1-136-153-00	FILM	0.01MF	5%	50V
C213	1-131-450-00	TANTALUM	1MF	20%	50V
C214	1-136-153-00	FILM	0.01MF	5%	50V
C215	1-136-580-11	FILM	0.47MF	10%	200V
C216	1-123-378-00	ELECT	1000MF	20%	63V
C217	1-136-580-11	FILM	0.47MF	10%	200V
C218	1-123-378-00	ELECT	1000MF	20%	63V
C219	1-136-177-00	FILM	1MF	5%	50V
C220	1-124-700-11	ELECT	330MF	20%	25V
C301	1-136-580-11	FILM	0.47MF	10%	200V
C302	1-136-580-11	FILM	0.47MF	10%	200V
C303	1-123-376-00	ELECT	330MF	20%	63V
C304	1-136-580-11	FILM	0.47MF	10%	200V
C305	1-136-580-11	FILM	0.47MF	10%	200V
C306	1-136-580-11	FILM	0.47MF	10%	200V
C307	1-136-165-00	FILM	0.1MF	5%	50V
C308	1-136-165-00	FILM	0.1MF	5%	50V
C309	1-136-165-00	FILM	0.1MF	5%	50V
C310	1-136-165-00	FILM	0.1MF	5%	50V
C311	1-136-165-00	FILM	0.1MF	5%	50V
C312	1-136-165-00	FILM	0.1MF	5%	50V
C313	1-136-165-00	FILM	0.1MF	5%	50V
C314	1-136-165-00	FILM	0.1MF	5%	50V
C315	1-136-165-00	FILM	0.1MF	5%	50V
C316	1-136-165-00	FILM	0.1MF	5%	50V
C317	1-136-165-00	FILM	0.1MF	5%	50V
C318	1-136-165-00	FILM	0.1MF	5%	50V
C319	1-136-165-00	FILM	0.1MF	5%	50V
C320	1-136-165-00	FILM	0.1MF	5%	50V
C321	1-104-244-00	POLYSTYRENE	430PF	5%	125V
C322	1-107-324-00	MICA	0.0039MF	2%	100V
C323	1-130-893-00	FILM	0.027MF	3%	100V
C324	1-136-230-00	FILM	0.0022MF	3%	100V
C325	1-130-955-00	FILM	0.01MF	3%	100V
C326	1-136-230-00	FILM	0.0022MF	3%	100V
C327	1-136-230-00	FILM	0.0022MF	3%	100V
C328	1-136-230-00	FILM	0.0022MF	3%	100V
C329	1-107-159-00	MICA	33PF	5%	500V
C330	1-136-250-11	FILM	0.001MF	3%	100V
C331	1-136-230-00	FILM	0.0022MF	3%	100V
C332	1-130-848-00	FILM	0.0082MF	3%	100V
C333	1-104-235-00	POLYSTYRENE	820PF	5%	125V
C334	1-136-471-11	FILM	6.8MF	10%	100V
C401	1-136-580-11	FILM	0.47MF	10%	200V
C402	1-136-580-11	FILM	0.47MF	10%	200V
C403	1-123-376-00	ELECT	330MF	20%	63V
C404	1-136-580-11	FILM	0.47MF	10%	200V
C405	1-136-580-11	FILM	0.47MF	10%	200V
C406	1-136-580-11	FILM	0.47MF	10%	200V
C407	1-136-165-00	FILM	0.1MF	5%	50V
C408	1-136-165-00	FILM	0.1MF	5%	50V
C409	1-136-165-00	FILM	0.1MF	5%	50V
C410	1-136-165-00	FILM	0.1MF	5%	50V
C411	1-136-165-00	FILM	0.1MF	5%	50V
C412	1-136-165-00	FILM	0.1MF	5%	50V
C413	1-136-165-00	FILM	0.1MF	5%	50V
C414	1-136-165-00	FILM	0.1MF	5%	50V
C415	1-136-165-00	FILM	0.1MF	5%	50V
C416	1-136-165-00	FILM	0.1MF	5%	50V
C417	1-136-165-00	FILM	0.1MF	5%	50V

Ref.No	Part No.	Description			
C418	1-136-165-00	FILM	0.1MF	5%	50V
C419	1-136-165-00	FILM	0.1MF	5%	50V
C420	1-136-165-00	FILM	0.1MF	5%	50V
C421	1-104-244-00	POLYSTYRENE	430PF	5%	125V
C422	1-107-324-00	MICA	0.0039MF	2%	100V
C423	1-130-893-00	FILM	0.027MF	3%	100V
C424	1-136-230-00	FILM	0.0022MF	3%	100V
C425	1-130-955-00	FILM	0.01MF	3%	100V
C426	1-136-230-00	FILM	0.0022MF	3%	100V
C427	1-136-230-00	FILM	0.0022MF	3%	100V
C428	1-136-230-00	FILM	0.0022MF	3%	100V
C429	1-107-159-00	MICA	33PF	5%	500V
C430	1-136-250-11	FILM	0.001MF	3%	100V
C431	1-136-230-00	FILM	0.0022MF	3%	100V
C432	1-130-848-00	FILM	0.0082MF	3%	100V
C433	1-104-235-00	POLYSTYRENE	820PF	5%	125V
C434	1-136-471-11	FILM	6.8MF	10%	100V
C501	1-130-857-00	FILM	0.047MF	5%	100V
C502	1-136-580-11	FILM	0.47MF	10%	200V
C503	1-125-510-11	ELECT	3300MF	20%	63V
C504	1-125-510-11	ELECT	3300MF	20%	63V
C505	1-123-381-00	ELECT	2.2MF	20%	50V
C506	1-124-748-11	ELECT	22MF	20%	100V
C507	1-136-173-00	FILM	0.47MF	5%	50V
C508	1-124-700-11	ELECT	330MF	20%	25V
C509	1-136-153-00	FILM	0.01MF	5%	50V
C510	1-125-509-11	ELECT	1800MF	20%	63V
C511	1-136-583-11	FILM	1MF	10%	200V
C512	1-130-321-00	FILM	0.1MF	5%	100V
C513	1-136-583-11	FILM	1MF	10%	200V
C514	1-125-510-11	ELECT	3300MF	20%	63V
C515	1-125-510-11	ELECT	3300MF	20%	63V
C516	1-125-510-11	ELECT	3300MF	20%	63V
C517	1-125-510-11	ELECT	3300MF	20%	63V
C518	1-124-918-11	ELECT	47MF	20%	63V
C519	1-124-918-11	ELECT	47MF	20%	63V
C520	1-124-918-11	ELECT	47MF	20%	63V
C521	1-124-748-11	ELECT	22MF	20%	100V
C522	1-124-918-11	ELECT	47MF	20%	63V
C523	1-124-748-11	ELECT	22MF	20%	100V
C524	1-107-206-00	MICA	15PF	5%	500V
C525	1-107-206-00	MICA	15PF	5%	500V
C526	1-125-509-11	ELECT	1800MF	20%	63V
C527	1-125-509-11	ELECT	1800MF	20%	63V
C528	1-136-583-11	FILM	1MF	10%	200V
C529	1-136-583-11	FILM	1MF	10%	200V
C601	1-136-153-00	FILM	0.01MF	5%	50V
C602	1-136-153-00	FILM	0.01MF	5%	50V
C701	⚠1-161-744-00	CERAMIC	0.01MF		400V
C751	⚠1-161-744-00	CERAMIC	0.01MF		400V
C752	⚠1-161-744-00	CERAMIC	0.01MF		400V
C801	1-136-153-00	FILM	0.01MF	5%	50V
C802	1-136-153-00	FILM	0.01MF	5%	50V
C803	1-136-153-00	FILM	0.01MF	5%	50V
C804	1-136-153-00	FILM	0.01MF	5%	50V
C805	1-136-153-00	FILM	0.01MF	5%	50V
C806	1-136-153-00	FILM	0.01MF	5%	50V
C807	1-136-153-00	FILM	0.01MF	5%	50V
C901	1-136-153-00	FILM	0.01MF	5%	50V
CN101	*1-564-506-11	PLUG, CONNECTOR 3P			
CN102	*1-564-508-11	PLUG, CONNECTOR 5P			
CN103	*1-564-507-11	PLUG, CONNECTOR 4P			
CN104	*1-564-508-11	PLUG, CONNECTOR 5P			
CN105	*1-564-508-11	PLUG, CONNECTOR 5P			
CN106	*1-564-507-11	PLUG, CONNECTOR 4P			

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description
CN107	*1-564-507-11	PLUG, CONNECTOR 4P
CN108	*1-564-507-11	PLUG, CONNECTOR 4P
CN109	*1-564-509-11	PLUG, CONNECTOR 6P
CN110	*1-564-507-11	PLUG, CONNECTOR 4P
CN201	*1-564-508-11	PLUG, CONNECTOR 5P
CN202	*1-564-508-11	PLUG, CONNECTOR 5P
CN203	*1-564-506-11	PLUG, CONNECTOR 3P
CN204	*1-564-507-11	PLUG, CONNECTOR 4P
CN205	*1-564-507-11	PLUG, CONNECTOR 4P
CN501	*1-564-508-11	PLUG, CONNECTOR 5P
CN601	*1-564-507-11	PLUG, CONNECTOR 4P
CN801	*1-564-519-11	PLUG, CONNECTOR 4P
CN802	*1-564-521-11	PLUG, CONNECTOR 6P
CN803	*1-564-518-11	PLUG, CONNECTOR 3P
CN901	*1-564-518-11	PLUG, CONNECTOR 3P
CN951	*1-564-507-11	PLUG, CONNECTOR 4P
D101	8-719-123-78	DIODE 1SS97-2
D102	8-719-123-78	DIODE 1SS97-2
D103	8-719-940-76	DIODE 1SS132
D104	8-719-940-76	DIODE 1SS132
D105	8-719-940-76	DIODE 1SS132
D106	8-719-940-76	DIODE 1SS132
D107	8-719-123-78	DIODE 1SS97-2
D201	8-719-123-78	DIODE 1SS97-2
D301	8-719-940-76	DIODE 1SS132
D302	8-719-940-76	DIODE 1SS132
D401	8-719-940-76	DIODE 1SS132
D402	8-719-940-76	DIODE 1SS132
D501	8-719-200-39	DIODE C16P20F
D502	8-719-200-40	DIODE C16P20FR
D503	8-719-200-39	DIODE C16P20F
D504	8-719-911-55	DIODE 10DF6
D505	8-719-911-55	DIODE 10DF6
D506	8-719-931-07	DIODE EQB01-07
D507	8-719-931-07	DIODE EQB01-07
D508	8-719-224-12	DIODE 10YD1.3A
D509	8-719-224-12	DIODE 10YD1.3A
D510	8-719-224-12	DIODE 10YD1.3A
D511	8-719-224-12	DIODE 10YD1.3A
D801	8-719-310-84	DIODE SEL1510C-S
D802	8-719-310-84	DIODE SEL1510C-S
D803	8-719-310-84	DIODE SEL1510C-S
D804	8-719-907-75	DIODE AA5534S
D805	8-719-310-84	DIODE SEL1510C-S
D806	8-719-310-84	DIODE SEL1510C-S
D807	8-719-310-84	DIODE SEL1510C-S
D901	8-719-303-84	DIODE SEL2510C-D
F701	⚠1-532-265-XX	(US)....FUSE, GLASS TUBE (1A)
F701	⚠1-532-279-00	(WG)....FUSE, TIME-LAG (T500mA)
F702	⚠1-532-066-00	(WG)....FUSE, TIME-LAG (T400mA)
F702	⚠1-532-401-XX	(US)....FUSE, GLASS TUBE (0.8A)
IC101	8-759-202-13	IC TC74HCU04P
IC102	8-759-202-14	IC TC74HC08P
IC103	8-759-202-11	IC TC74HC00P
IC104	8-759-202-13	IC TC74HCU04P
IC105	8-759-202-24	IC TC74HC86P
IC106	8-759-202-12	IC TC74HC02P
IC107	8-759-000-99	IC MC74HC74N
IC108	8-759-202-86	IC TC74HC123P
IC109	8-752-322-31	IC CXD1076P
IC110	8-759-202-13	IC TC74HCU04P
IC111	8-752-327-29	IC CXD1144AP
IC112	8-759-947-89	IC CXD1329S
IC113	8-759-918-71	IC CX23065
IC114	8-759-906-24	IC SN74LS624N
IC115	8-759-202-85	IC TC74HC112P
IC116	8-759-000-99	IC MC74HC74N
IC117	8-759-203-40	IC TC74HC393P
IC118	8-759-202-11	IC TC74HC00P
IC119	8-759-918-71	IC CX23065
IC120	8-759-906-24	IC SN74LS624N
IC121	8-759-203-40	IC TC74HC393P
IC122	8-759-202-17	IC TC74HC14P
IC123	8-759-203-40	IC TC74HC393P
IC124	8-759-202-85	IC TC74HC112P
IC125	8-759-202-11	IC TC74HC00P
IC126	8-759-202-11	IC TC74HC00P
IC127	8-759-202-12	IC TC74HC02P
IC128	8-759-645-19	IC M54519P
IC129	8-759-202-13	IC TC74HCU04P
IC201	8-759-202-11	IC TC74HC00P
IC202	8-759-203-01	IC TC74HC175P
IC203	8-759-202-13	IC TC74HCU04P
IC204	8-719-902-56	IC PC817
IC205	8-719-902-56	IC PC817
IC206	8-759-604-33	IC M5F7812
IC208	8-759-604-29	IC M5F7805
IC209	8-759-604-47	IC M5F7905
IC301	8-759-972-89	IC TDA1541A-S1
IC302	8-759-932-31	IC LF356H-K
IC303	8-759-971-80	IC AD712JN
IC304	8-759-603-97	IC M5240PS
IC401	8-759-972-89	IC TDA1541A-S1
IC402	8-759-932-31	IC LF356H-K
IC403	8-759-971-80	IC AD712JN
IC404	8-759-603-97	IC M5240PS
IC501	8-759-202-17	IC TC74HC14P
IC502	8-759-604-29	IC M5F7805
IC503	8-759-604-35	IC M5F78M05
J101	1-507-918-00	JACK, PIN 1P (LINE OUT)
J102	1-507-918-00	JACK, PIN 1P (LINE OUT)
J103	1-565-064-11	JACK, PIN 1P (AUX 1)
J104	1-565-064-11	JACK, PIN 1P (AUX 2)
L101	1-410-324-11	INDUCTOR 4.7UH
L102	1-410-324-11	INDUCTOR 4.7UH
L103	1-410-324-11	INDUCTOR 4.7UH
L104	1-410-324-11	INDUCTOR 4.7UH
L105	1-410-324-11	INDUCTOR 4.7UH
L106	1-410-324-11	INDUCTOR 4.7UH
L107	1-410-324-11	INDUCTOR 4.7UH
L108	1-410-324-11	INDUCTOR 4.7UH
L109	1-410-324-11	INDUCTOR 4.7UH
L110	1-410-324-11	INDUCTOR 4.7UH
L111	1-410-324-11	INDUCTOR 4.7UH
L112	1-410-324-11	INDUCTOR 4.7UH
L113	1-410-324-11	INDUCTOR 4.7UH
L114	1-410-324-11	INDUCTOR 4.7UH
L115	1-410-324-11	INDUCTOR 4.7UH
L116	1-408-912-11	INDUCTOR 1MMH
L117	1-410-324-11	INDUCTOR 4.7UH
L118	1-408-912-11	INDUCTOR 1MMH
L119	1-410-324-11	INDUCTOR 4.7UH
L120	1-410-513-11	INDUCTOR 22UH
L121	1-410-513-11	INDUCTOR 22UH
L122	1-410-513-11	INDUCTOR 22UH
L123	1-410-513-11	INDUCTOR 22UH
L124	1-410-628-11	COIL, CHOKE 200UH
L150	1-410-577-21	INDUCTOR 1UH

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description
L201	1-410-548-21	INDUCTOR 4.7UH
L202	1-410-548-21	INDUCTOR 4.7UH
L601	1-408-072-00	INDUCTOR 47UH
L751	⚠1-424-155-11	COIL, LINE FILTER
OPL601	1-464-907-11	I/O UNIT, LIGHT (CD OPTICAL IN/OUT)
Q101	8-729-201-52	TRANSISTOR 2SA1015
Q201	8-729-177-43	TRANSISTOR 2SD774
Q202	8-729-177-43	TRANSISTOR 2SD774
Q301	8-765-640-10	TRANSISTOR 2SK244
Q302	8-729-200-56	TRANSISTOR 2SK241GR
Q303	8-729-200-56	TRANSISTOR 2SK241GR
Q304	8-729-200-56	TRANSISTOR 2SK241GR
Q305	8-729-321-35	TRANSISTOR 2SK213
Q306	8-729-307-65	TRANSISTOR 2SJ76
Q307	8-729-104-18	TRANSISTOR 2SC3514
Q401	8-765-640-10	TRANSISTOR 2SK244
Q402	8-729-200-56	TRANSISTOR 2SK241GR
Q403	8-729-200-56	TRANSISTOR 2SK241GR
Q404	8-729-200-56	TRANSISTOR 2SK241GR
Q405	8-729-321-35	TRANSISTOR 2SK213
Q406	8-729-307-65	TRANSISTOR 2SJ76
Q407	8-729-104-18	TRANSISTOR 2SC3514
Q501	8-729-107-53	TRANSISTOR 2SC2275-P
Q502	8-729-118-53	TRANSISTOR 2SA985-P
Q503	8-729-104-91	TRANSISTOR 2SA1383
Q504	8-729-104-91	TRANSISTOR 2SA1383
Q505	8-729-104-18	TRANSISTOR 2SC3514
Q506	8-729-104-18	TRANSISTOR 2SC3514
Q507	8-729-104-18	TRANSISTOR 2SC3514
Q508	8-729-104-18	TRANSISTOR 2SC3514
Q509	8-729-104-91	TRANSISTOR 2SA1383
Q510	8-729-104-91	TRANSISTOR 2SA1383
Q511	8-729-366-61	TRANSISTOR 2SD666-B
Q512	8-729-364-61	TRANSISTOR 2SB646-B
Q513	8-729-364-61	TRANSISTOR 2SB646-B
Q514	8-729-364-61	TRANSISTOR 2SB646-B
Q515	8-729-366-61	TRANSISTOR 2SD666-B
Q516	8-729-366-61	TRANSISTOR 2SD666-B
Q517	8-729-178-54	TRANSISTOR 2SC2785
Q518	8-729-801-83	TRANSISTOR 2SB1013

RESISTOR

Ref.No	Part No.	Description			
R101	1-259-401-11	CARBON	75	5%	1/6W
R102	1-259-401-11	CARBON	75	5%	1/6W
R103	1-259-428-11	CARBON	1K	5%	1/6W
R104	1-259-500-11	CARBON	1M	5%	1/6W
R105	1-259-428-11	CARBON	1K	5%	1/6W
R106	1-259-500-11	CARBON	1M	5%	1/6W
R113	1-259-412-11	CARBON	220	5%	1/6W
R114	1-259-452-11	CARBON	10K	5%	1/6W
R115	1-259-439-11	CARBON	3K	5%	1/6W
R116	1-215-452-00	METAL	20K	1%	1/6W
R117	1-215-444-00	METAL	9.1K	1%	1/6W
R118	1-215-456-00	METAL	30K	1%	1/6W
R119	1-259-452-11	CARBON	10K	5%	1/6W
R120	1-259-436-11	CARBON	2.2K	5%	1/6W
R121	1-259-428-11	CARBON	1K	5%	1/6W
R122	1-259-456-11	CARBON	15K	5%	1/6W
R123	1-259-428-11	CARBON	1K	5%	1/6W
R124	1-259-404-11	CARBON	100	5%	1/6W
R125	1-259-444-11	CARBON	4.7K	5%	1/6W
R126	1-259-444-11	CARBON	4.7K	5%	1/6W
R127	1-259-404-11	CARBON	100	5%	1/6W
R128	1-259-412-11	CARBON	220	5%	1/6W
R129	1-259-412-11	CARBON	220	5%	1/6W
R130	1-259-412-11	CARBON	220	5%	1/6W
R131	1-259-412-11	CARBON	220	5%	1/6W
R132	1-259-412-11	CARBON	220	5%	1/6W
R133	1-259-416-11	CARBON	330	5%	1/6W
R134	1-259-416-11	CARBON	330	5%	1/6W
R135	1-259-412-11	CARBON	220	5%	1/6W
R136	1-259-500-11	CARBON	1M	5%	1/6W
R137	1-259-428-11	CARBON	1K	5%	1/6W
R138	1-259-412-11	CARBON	220	5%	1/6W
R139	1-259-436-11	CARBON	2.2K	5%	1/6W
R140	1-259-403-11	CARBON	91	5%	1/6W
R141	1-259-403-11	CARBON	91	5%	1/6W
R142	1-259-403-11	CARBON	91	5%	1/6W
R143	1-259-408-11	CARBON	150	5%	1/6W
R144	1-259-403-11	CARBON	91	5%	1/6W
R145	1-259-403-11	CARBON	91	5%	1/6W
R146	1-259-403-11	CARBON	91	5%	1/6W
R147	1-259-428-11	CARBON	1K	5%	1/6W
R148	1-259-428-11	CARBON	1K	5%	1/6W
R149	1-259-428-11	CARBON	1K	5%	1/6W
R150	1-259-428-11	CARBON	1K	5%	1/6W
R151	1-259-444-11	CARBON	4.7K	5%	1/6W
R152	1-259-424-11	CARBON	680	5%	1/6W
R153	1-259-404-11	CARBON	100	5%	1/6W
R154	1-259-444-11	CARBON	4.7K	5%	1/6W
R155	1-259-412-11	CARBON	220	5%	1/6W
R156	1-259-476-11	CARBON	100K	5%	1/6W
R157	1-259-452-11	CARBON	10K	5%	1/6W
R158	1-259-428-11	CARBON	1K	5%	1/6W
R159	1-259-412-11	CARBON	220	5%	1/6W
R160	1-259-412-11	CARBON	220	5%	1/6W
R161	1-259-412-11	CARBON	220	5%	1/6W
R162	1-259-484-11	CARBON	220K	5%	1/6W
R163	1-259-428-11	CARBON	1K	5%	1/6W
R164	1-259-452-11	CARBON	10K	5%	1/6W
R165	1-259-464-11	CARBON	33K	5%	1/6W
R166	1-259-428-11	CARBON	1K	5%	1/6W
R167	1-259-452-11	CARBON	10K	5%	1/6W
R168	1-259-412-11	CARBON	220	5%	1/6W
R169	1-259-412-11	CARBON	220	5%	1/6W
R170	1-259-412-11	CARBON	220	5%	1/6W
R171	1-259-412-11	CARBON	220	5%	1/6W
R172	1-259-412-11	CARBON	220	5%	1/6W
R173	1-259-428-11	CARBON	1K	5%	1/6W
R174	1-259-428-11	CARBON	1K	5%	1/6W
R175	1-259-428-11	CARBON	1K	5%	1/6W
R176	1-259-428-11	CARBON	1K	5%	1/6W
R177	1-259-416-11	CARBON	330	5%	1/6W
R180	1-259-416-11	CARBON	330	5%	1/6W
R181	1-259-416-11	CARBON	330	5%	1/6W
R182	1-259-416-11	CARBON	330	5%	1/6W
R183	1-259-416-11	CARBON	330	5%	1/6W
R184	1-259-404-11	CARBON	100	5%	1/6W
R185	1-259-428-11	CARBON	1K	5%	1/6W
R186	1-259-416-11	CARBON	330	5%	1/6W
R190	1-259-476-11	CARBON	100K	5%	1/6W
R195	1-259-412-11	CARBON	220	5%	1/6W
R196	1-259-416-11	CARBON	330	5%	1/6W
R201	1-247-706-11	CARBON	330	5%	1/4W
R202	1-247-706-11	CARBON	330	5%	1/4W
R203	1-247-721-11	CARBON	4.7K	1%	1/4W
R204	1-246-545-00	CARBON	1M	1%	1/4W
R205	1-247-704-11	CARBON	220	5%	1/4W
R206	1-247-713-11	CARBON	1K	5%	1/4W

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description				
R207	1-247-138-00	CARBON	2K	5%	1/4W	
R208	1-247-708-11	CARBON	470	5%	1/4W	
R209	1-247-713-11	CARBON	1K	5%	1/4W	
R210	1-247-138-00	CARBON	2K	5%	1/4W	
R211	1-247-706-11	CARBON	330	5%	1/4W	
R212	1-247-706-11	CARBON	330	5%	1/4W	
R213	1-247-706-11	CARBON	330	5%	1/4W	
R214	1-247-706-11	CARBON	330	5%	1/4W	
R215	1-249-556-11	CARBON	1.5K	5%	1/4W	
R301	1-259-675-11	CARBON	910	2%	1W	
R302	1-259-549-11	CARBON	560	1%	1/2W	
R303	1-259-627-11	CARBON	1M	1%	1/2W	
R304	1-259-681-11	CARBON	1.6K	2%	1W	
R305	1-259-560-11	CARBON	1.6K	1%	1/2W	
R306	1-259-560-11	CARBON	1.6K	1%	1/2W	
R307	1-259-560-11	CARBON	1.6K	1%	1/2W	
R308	1-259-579-11	CARBON	10K	1%	1/2W	
R309	1-259-579-11	CARBON	10K	1%	1/2W	
R310	1-259-555-11	CARBON	1K	1%	1/2W	
R311	1-259-539-11	CARBON	220	1%	1/2W	
R312	1-259-551-11	CARBON	680	1%	1/2W	
R313	1-259-551-11	CARBON	680	1%	1/2W	
R314	1-259-539-11	CARBON	220	1%	1/2W	
R315	1-259-541-11	CARBON	270	1%	1/2W	
R316	1-259-555-11	CARBON	1K	1%	1/2W	
R317	1-259-571-11	CARBON	4.7K	1%	1/2W	
R318	1-259-555-11	CARBON	1K	1%	1/2W	
R319	1-259-676-11	CARBON	1K	2%	1W	
R320	1-259-652-11	CARBON	100	2%	1W	
R321	1-259-652-11	CARBON	100	2%	1W	
R322	1-259-636-11	CARBON	22	2%	1W	
R323	1-259-619-11	CARBON	470K	1%	1/2W	
R401	1-259-675-11	CARBON	910	2%	1W	
R402	1-259-549-11	CARBON	560	1%	1/2W	
R403	1-259-627-11	CARBON	1M	1%	1/2W	
R404	1-259-681-11	CARBON	1.6K	2%	1W	
R405	1-259-560-11	CARBON	1.6K	1%	1/2W	
R406	1-259-560-11	CARBON	1.6K	1%	1/2W	
R407	1-259-560-11	CARBON	1.6K	1%	1/2W	
R408	1-259-579-11	CARBON	10K	1%	1/2W	
R409	1-259-579-11	CARBON	10K	1%	1/2W	
R410	1-259-555-11	CARBON	1K	1%	1/2W	
R411	1-259-539-11	CARBON	220	1%	1/2W	
R412	1-259-551-11	CARBON	680	1%	1/2W	
R413	1-259-551-11	CARBON	680	1%	1/2W	
R414	1-259-539-11	CARBON	220	1%	1/2W	
R415	1-259-541-11	CARBON	270	1%	1/2W	
R416	1-259-555-11	CARBON	1K	1%	1/2W	
R417	1-259-571-11	CARBON	4.7K	1%	1/2W	
R418	1-259-555-11	CARBON	1K	1%	1/2W	
R419	1-259-676-11	CARBON	1K	2%	1W	
R420	1-259-652-11	CARBON	100	2%	1W	
R421	1-259-652-11	CARBON	100	2%	1W	
R422	1-259-636-11	CARBON	22	2%	1W	
R423	1-259-619-11	CARBON	470K	1%	1/2W	
R501	⚠1-212-875-00	FUSIBLE	56	5%	1/4W	F
R502	1-249-598-11	CARBON	82K	5%	1/4W	
R503	1-247-708-11	CARBON	470	5%	1/4W	
R504	1-249-586-11	CARBON	27K	5%	1/4W	
R505	1-247-725-11	CARBON	10K	5%	1/4W	
R506	1-249-609-11	CARBON	240K	5%	1/4W	
R507	1-249-602-11	CARBON	120K	5%	1/4W	
R508	⚠1-212-865-00	FUSIBLE	22	5%	1/4W	F
R509	1-259-563-11	CARBON	2.2K	1%	1/2W	
R510	1-259-563-11	CARBON	2.2K	1%	1/2W	

Ref.No	Part No.	Description			
R511	1-259-571-11	CARBON	4.7K	1%	1/2W
R512	1-259-571-11	CARBON	4.7K	1%	1/2W
R513	1-259-525-11	CARBON	56	1%	1/2W
R514	1-259-525-11	CARBON	56	1%	1/2W
R515	1-259-555-11	CARBON	1K	1%	1/2W
R516	1-259-555-11	CARBON	1K	1%	1/2W
R517	1-259-579-11	CARBON	10K	1%	1/2W
R518	1-259-555-11	CARBON	1K	1%	1/2W
R519	1-259-579-11	CARBON	10K	1%	1/2W
R520	1-259-555-11	CARBON	1K	1%	1/2W
R521	1-259-559-11	CARBON	1.5K	1%	1/2W
R522	1-259-559-11	CARBON	1.5K	1%	1/2W
R523	1-259-555-11	CARBON	1K	1%	1/2W
R524	1-259-555-11	CARBON	1K	1%	1/2W
R525	1-259-541-11	CARBON	270	1%	1/2W
R526	1-259-565-11	CARBON	2.7K	1%	1/2W
R527	1-259-531-11	CARBON	100	1%	1/2W
R528	1-259-541-11	CARBON	270	1%	1/2W
R529	1-259-565-11	CARBON	2.7K	1%	1/2W
R530	1-259-531-11	CARBON	100	1%	1/2W
R531	1-259-676-11	CARBON	1K	2%	1W
R532	1-259-677-11	CARBON	1.1K	2%	1W
R533	1-259-676-11	CARBON	1K	2%	1W
R534	1-259-677-11	CARBON	1.1K	2%	1W
R602	1-249-540-11	CARBON	330	5%	1/4W
RSW951	1-571-372-11	SWITCH, ROTARY (DIGITAL INPUT)			
RV601	1-224-252-XX	RES, ADJ, METAL GLAZE 10K			
RY301	1-515-683-11	RELAY			
RY302	1-515-683-11	RELAY			
RY401	1-515-683-11	RELAY			
RY402	1-515-683-11	RELAY			
SW701	⚠1-571-250-11	SWITCH, PUSH (AC POWER) (1 KEY)			
T101	⚠1-449-427-11	(WG)....TRANSFORMER, POWER			
T101	⚠1-449-429-11	(US)....TRANSFORMER, POWER			
T102	⚠1-449-428-11	(WG)....TRANSFORMER, POWER			
T102	⚠1-449-430-11	(US)....TRANSFORMER, POWER			
X101	1-567-975-11	VIBRATOR, CRYSTAL 11.8MHz			
X201	1-567-972-11	VIBRATOR, CRYSTAL 11.2896MHz			

ACCESSORY & PACKING MATERIAL

Part No.	Description	Remark
1-558-271-11	CORD, CONNECTION	
1-558-378-11	CORD, CONNECTION	
3-769-750-21	(US)....MANUAL, INSTRUCTION	
3-769-750-11	(WG)....MANUAL, INSTRUCTION	
4-915-880-01	SHEET, PROTECTION	
*4-924-262-01	CUSHION	
*4-924-276-01	INDIVIDUAL CARTON	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

9-953-039-11

Sony Corporation
Audio Group

English
8810436-1
Printed in Japan

© 1988.9

Published by A/V Engineering Service Dept.